

Chapter 9: Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare

Topic	Daylight, Sunlight and Overshadowing
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SUPPORTING APPENDIX	ES Volume 3: Appendix: Daylight, Sunlight and Overshadowing (for ease of reference, hereafter referred in this chapter as 'ES Volume 3: Appendix: DSO') Annex I – Key Legislation, Planning Policy & Guidance Annex II – Drawings of the existing baseline, Proposed Development and Cumulative Assessment Annex III – Daylight and Sunlight results Annex IV – No Sky Line Contour drawings Annex V – Window Maps Annex VI – Sun Hours on Ground assessment Annex VII - Transient Overshadowing assessment Annex VIII – Internal Daylight, Sunlight and Overshadowing Report
KEY CONSIDERATIONS	This chapter outlines the relevant policy context; methodologies applied to identify and assess the potential daylight, sunlight and overshadowing impacts to sensitive receptors; baseline conditions at the site and its surrounds and the likely significant effects associated with the Development. Mitigation is set out as necessary and the residual effects are identified. The potential daylight, sunlight and overshadowing effects associated with the Proposed Development are as follows: • Temporary changes to daylight, sunlight and overshadowing, during the construction works; • Alterations to daylight and sunlight amenity to sensitive surrounding receptors on completion of the Proposed Development; • Changes to overshadowing of surrounding public and private amenity areas, in addition to amenity areas within the site on completion of the Proposed Development;
CONSULTATION	An EIA Scoping Report was prepared and submitted to the RBC in September 2018 requesting a formal Scoping Opinion from the RBC on the scope of the EIA. A copy of the EIA Scoping Report is provided in ES Volume 3: Appendix- EIA Scoping. A Scoping Opinion has not been received at the time of preparing this ES. The EIA has proceeded in the absence of a formal opinion received.

ASSESSMENT METHODOLOGY

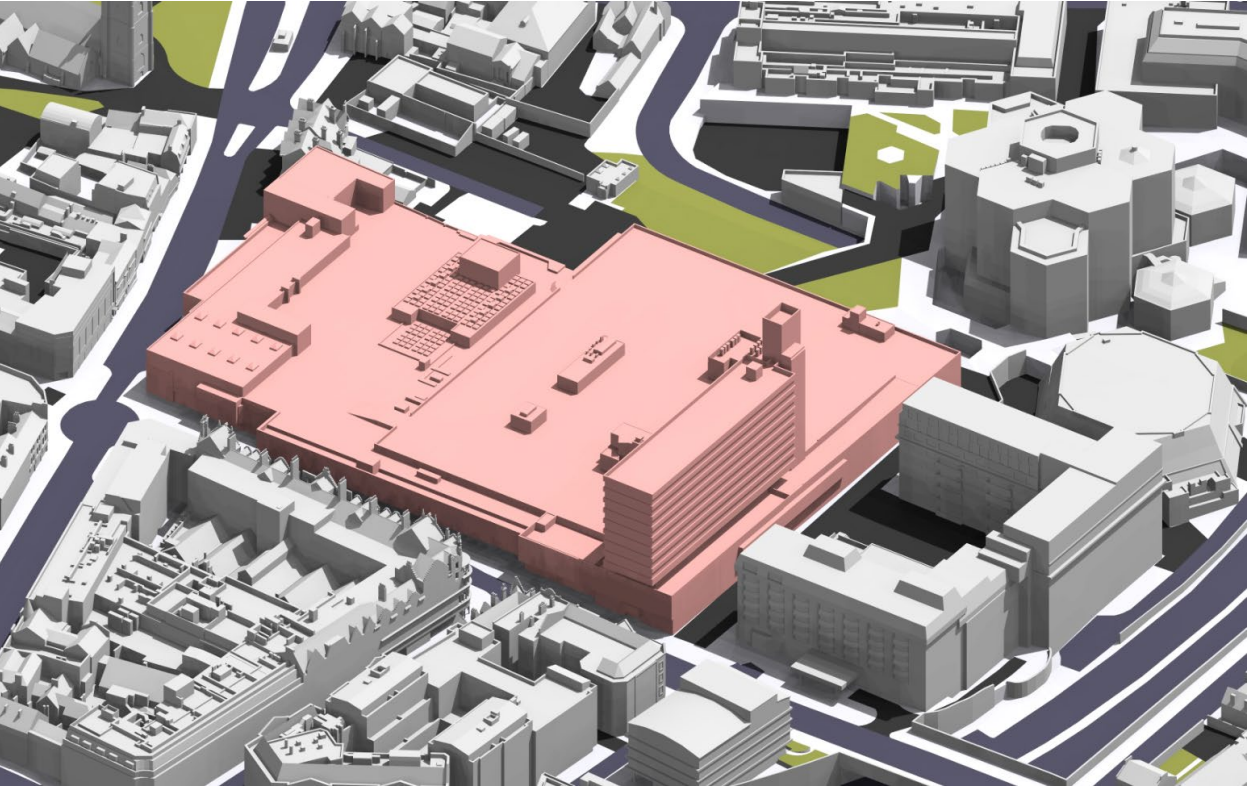
Defining the Baseline

Baseline Conditions

- 9.1
- An existing baseline scenario of the surrounding area has been established following a review of the land uses in proximity of the site with reference to information available via the Valuation Office Agency ('VOA') website¹ (i.e. council tax records) in order to identify potentially sensitive receptors.
- 9.2
- To accurately capture the existing baseline condition on-site, a detailed measured survey of the site and surrounding properties was undertaken by MBS Surveys Software Ltd in June 2018. This information forms the basis of the 3D AutoCAD computer model which has been utilised to undertake the assessments. Buildings considered to be within sufficient proximity (i.e. building massing is considered relevant to the daylight and sunlight amenity context for the site and neighbouring properties) to the site (determined on the basis of professional opinion) have been represented within the 3D computer model utilised for the assessment of the 'existing' context, or 'baseline condition'. Figure 9.1 shows the 3D representation of the existing baseline scenario (including the site and surrounding built context).
- 9.3
- The technical analysis presented in this ES Chapter, including assessment of the Baseline condition, has been undertaken in accordance with the BRE Guidelines² and defined by reference to the Vertical Sky Component (VSC), No-Sky Line (NSL) and Annual Probable Sunlight Hours (APSH) methods (refer to 'Impact Assessment – Completed Development' section of this ES Chapter for further details).
- 9.4
- The baseline level of overshadowing, with regard to relevant surrounding amenity spaces has been defined in terms of the 'Sun Hours on Ground' assessment (calculated on the 21st March³), and the 'Transient Overshadowing' method. (refer to 'Impact Assessment – Completed Development' section of this ES Chapter for further details).

¹ Website - VOA search engine - <http://cti.voa.gov.uk> (undertaken in July 2018)
² BRE Guidance - 'Site Layout Planning for Daylight and Sunlight 2011: A Guide to Good Practice'

Figure 9.1 3D Model of Existing Baseline Scenario.



Note: The existing buildings forming part of the site is shaded red.

Likely Evolution of the Baseline

- 9.5
- The conditions for the future baseline scenario have been qualitatively considered.
- 9.6
- The evolution of the baseline without the implementation of the Proposed Development is likely to be consistent with the information presented under the 'Cumulative Effects Assessment' section of this ES Chapter.

Impact Assessment

Assumptions and Limitation

Assessment Model

- 9.7
- In order to undertake the technical assessments, a 3D AutoCAD computer model of the site and neighbouring properties has been created, using the following available information:
- MBS Survey Software Ltd - 3D measured survey of the site and surrounding existing properties (the 'context model', survey undertaken in June 2018);
 - Accucities Ltd – 3D Photogrammetry wider context model (Photogrammetry captured 2016); and
 - Google Map and Bing Maps aerial imagery.
- 9.8
- The contextual scope of buildings considered has been determined as a reasonable zone based on professional opinion, which considers both the scale of the massing proposed and the proximity of those buildings which surround and face the site. Only those neighbouring properties which have windows facing towards the site have been included in the assessments.
- 9.9
- A series of site visits were undertaken between September 2017 and May 2018 in order to confirm building uses and rationalise floor plans obtained from research with what is *in-situ*.
- 9.10
- The Civic Centre building to the south-west of the site has been included in the context model as is represented within the Accucities Photogrammetry model based on aerial imagery captured 2016. It is understood that this

³ BRE Guidance – 3.2.11 states 'the sunlighting of an existing dwelling maybe adversely affected' if 'the centre of the window receives less than 25% of annual probable sunlight hours, or less than 5% of annual probable sunlight hours between 21st September and 21st March' and 'receives less than 0.8 times its former sunlight hours during either period'. 21st March and 21st September occur on the equinox where day and night are equal in length and as such represent midpoints of the yearly movements of the sun.

building is now demolished. It is considered that the inclusion of the building will be immaterial to the technical analysis and would present a 'worst case scenario' in any event.

Receptors – Habitable Rooms

- 9.11** The BRE Guidelines suggest that residential properties have the highest requirement for daylight and sunlight, stating 'The guidelines are intended for use for rooms in adjoining dwellings where light is required, including living rooms, kitchens and bedrooms'. Non-habitable rooms such as circulation spaces and bathrooms are not considered relevant for consideration by the BRE Guidelines. The assessments presented in this chapter therefore focus on habitable rooms within residential properties neighbouring the site that could be sensitive to impacts resulting from the Proposed Development. Only those neighbouring properties which have sensitive windows facing towards the site have been included in the assessments. The location of residential occupation within neighbouring properties was identified from external observation and VOA council tax band searches.

Solar Glare

- 9.12** In terms of solar glare, this can occur when sunlight is reflected from a glazed façade or area of metal cladding. This can affect road and rail users and the occupants of adjoining buildings.
- 9.13** According to BRE Guidelines (5.8.1), the problem can occur either when there are large areas of reflective glass or cladding which slope back so that high altitude sunlight can be reflected along the ground. Thus, solar glare is only a long-term problem for some heavily glazed (or mirror clad) buildings.
- 9.14** It is anticipated that the Proposed Development will not comprise such a design and that the proposed facades will be broken up by solid non-reflective elements (see **ES Volume 1: Chapter 4 – Proposed Development**). Therefore, it is anticipated that a solar glare assessment will not be required and has been scoped out of the assessment.

Light Pollution

- 9.15** In terms of light pollution, this is defined as light emitting from artificial sources into spaces where this light would be unwanted, such as spillage of electric light from office or commercial buildings into residential accommodation such as bedrooms, where this would cause inconvenience to occupants.
- 9.16** Quantitative criteria for acceptable levels of light pollution are detailed within the Institution of Lighting Professionals (ILP) document⁴. The Proposed Development is predominately residential and, therefore, the residential properties surrounding the site will not be assessed for light pollution. However, where external lighting will be provided within the landscaping proposals for the site, as identified in the planning submission, the final lighting scheme will demonstrate it is in accordance with the ILP specifications.

External Receptors

- 9.17** Internal layouts of neighbouring properties are only relevant for the 'No Sky Line' (NSL) assessment methodology (associated with daylight distribution). Access to any of the neighbouring properties has not been sought to undertake the assessments; however, partial or full floor plans were sourced for a number of the neighbouring properties and incorporated within the assessment. These floor plans were acquired from a mix of sources, including: the RBC planning application search website⁵, estate agent websites⁶ and online searches⁷.
- 9.18** Internal layout information has been sourced for the following surrounding existing properties:
- 38 Oxford Road;
 - 59-60 St Mary's Butts;
 - 15 Queens Walk (Queens Court); and
 - McIlroys Building.
- 9.19** Where internal layouts have not been acquired, reasonable assumptions have been made based on practitioner experience, in most cases assuming a standard 4.2m deep room (14ft) for residential properties (unless the building form dictates otherwise). Based on practitioner experience internal layouts have been incorporated where access to buildings is unavailable and layouts have not been acquired. Internal layout information have been assumed for the following properties:
- 40-42 Oxford Road;
 - 61-62 St Mary's Butts;

- 58 St Mary's Butts;
- 57 St Mary's Butts;
- 55-56 St Mary's Butts;
- 16 Castle Street;
- 8 Castle Street; and
- 2-6 Castle Street.

- 9.20** The contextual scope of buildings considered has been determined as a reasonable zone which considers both the scale of the massing proposed and the proximity of those buildings which surround and face the site. Only those neighbouring properties which have windows facing towards the site have been included in the assessments.
- 9.21** Floor levels have also been assumed for the neighbouring properties where this information was not available from available drawings. This dictates the level of the working plane which is relevant for the NSL assessment.
- 9.22** In relation to sunlight analysis (APSH), only windows which are orientated within 90 degrees of due south have been considered as they have a reasonable expectation of sunlight.
- 9.23** Due to the southerly rotation of the sun, only sensitive amenity areas located to the north of the site have been considered for the purpose of the overshadowing assessment.

Demolition and Construction

- 9.24** There is no particular methodology for determining demolition and construction effects as these are variable and constantly change as partial demolition is undertaken and the Proposed Development is constructed.
- 9.25** However, with regard to daylight, sunlight and overshadowing, it is considered that the potential impacts would vary throughout the demolition and construction phases and gradually increase to the potential effects identified for the completed Proposed Development.
- 9.26** During the construction phase, a number of tall cranes are likely to be present on-site (see **ES Chapter 5 – Demolition and Construction (Volume 1)**). It is considered highly unlikely that any impact in relation to daylight, sunlight, and overshadowing will be caused to neighbouring properties as a result of vehicles and construction related activities. Any effects (at worst) would be temporary, and most likely negligible in terms of the effect on surrounding receptors.
- 9.27** It is therefore considered that the completed Proposed Development represents the worst-case assessment in terms of likely daylight, sunlight, and overshadowing effects.
- 9.28** On this basis, no technical analysis of the likely effects on the surrounding properties and amenity spaces during the demolition and construction phases has been carried out and the remainder of this chapter focuses on the effects relating to the completed Proposed Development.

Completed Development

- 9.29** The assessment of the completed Proposed Development has been undertaken in accordance with the BRE Guidelines. The following methods have been considered to assess the likely impact of the Proposed Development on sensitive neighbouring receptors:
- Daylight:
 - Vertical Sky Component (VSC);
 - No Sky Line (NSL) assessments;
 - Sunlight:
 - Annual Probable Sunlight Hours (APSH) assessment;
 - Overshadowing:
 - Sun Hours on Ground;
 - Transient Overshadowing assessments.

⁴ Institution of Lighting Professionals (ILP) – "Guidance Notes for the Reduction of Obtrusive Light"

⁵ RBC planning application: http://planning.reading.gov.uk/fastweb_PL/welcome.asp (accessed June 2018)

⁶ Agent websites: <https://www.zoopla.co.uk/>, <https://www.rightmove.co.uk/> (accessed June 2018)

⁷ Online searches: Google.com (accessed June 2018)

Daylight

VSC

- 9.30** The VSC method of assessment is defined in the BRE Guidelines as the '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'.
- 9.31** This ratio is the percentage of the total unobstructed view that is available, once obstructions (e.g. the Proposed Development), are placed in front of the point of view.
- 9.32** The assessment is calculated from the centre of a window on the outward face and measures the amount of light available on a vertical wall or window following the introduction of visible barriers, such as buildings.
- 9.33** The VSC has been calculated by using a 'Waldram Diagram'. The Waldram Diagram is effectively a snapshot that is taken from that point of the sky in front of the window, together with all relevant obstructions to it, i.e. the buildings. For calculation purposes, trees may be ignored unless they form dense continuous belts.
- 9.34** The maximum VSC value is almost 40% for a completely unobstructed vertical wall or window. In terms of assessment criteria, the BRE Guidelines state that: *'if the VSC, with the development in place, is both less than 27% and less than 0.8 times its former value, occupants of the existing building will notice the reduction in the amount of skylight. The area lit by the window may appear more gloomy and electric lighting will be needed more of the time.'*

NSL

- 9.35** The BRE Guidelines advise that where room layouts are known, the effect on the daylight distribution can be calculated by plotting the NSL. In terms of the neighbouring receptors, it has not been possible to obtain room layouts for all of the properties and therefore their layouts have been assumed where information has been unavailable.
- 9.36** The NSL 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.
- 9.37** The potential effects of daylight distribution in an existing building can be identified by plotting the NSL in each of the main rooms. For residential dwellings, this will include living rooms, dining rooms and kitchens. Bedrooms should also be analysed, although they are less important in terms of daylight and sunlight amenity due to the nature of their use. The BRE Guidelines identify (2.2.9) that if the area of a room that does receive direct sky light is reduced to less than 0.8 times its former value, then this would be noticeable to its occupants.
- 9.38** In regard to deep rooms which are lit by windows on one side, the BRE Guidelines state at paragraph 2.2.10: *'If an existing building contains rooms lit from one side only and greater than 5 m deep, then a greater movement of the no sky line may be unavoidable.'*
- 9.39** Only residential properties and schools have been considered by the daylight assessment. Offices and retail spaces are not considered sensitive receptors to daylight amenity. In addition, non-habitable rooms such as circulation spaces and bathrooms have not been considered, in accordance with the BRE Guidelines.
- 9.40** The BRE Guidelines state in Section 2.2.2:
- "The guidelines given here are intended for use for rooms in adjoining dwellings where daylight is required, including living rooms, kitchens and bedrooms. Windows to bathrooms, toilets, storerooms, circulation areas and garages need not be analysed."*

Sunlight

Annual Probable Sunlight Hours (APSH)

- 9.41** With regard to sunlight, the same skylight indicator is used as the VSC assessment using the same reference point to calculate Annual Probable Sunlight Hours (APSH), which is expressed as a percentage. The BRE guidelines state:
- "Access to sunlight should be checked for the main window of each room which faces within 90 degrees (°) of due south".*
- 9.42** The maximum number of APSH for the London orientation is 1,486 hours. Sunlight is measured using a sun indicator which contains 100 spots, each representing 1% of APSH. Therefore, where no obstruction exists,

the total APSH would amount to 1,486 and therefore each spot equates to 14.86 hours of the total annual sunlight hours. The number of spots is calculated for the baseline and Proposed Development scenarios during the year and also during the winter period. This provides a percentage of APSH for each of the time periods for each window assessed.

- 9.43** The BRE Guidelines propose that the appropriate date for undertaking a sunlight assessment is on 21st March, (the Spring Equinox). Calculations of both summer and winter availability are made with the winter analysis (WPSH) covering the period from the 21st September to 21st March.
- 9.44** The BRE Guidelines state in Section 3.2.3 that:
- "[...] kitchens and bedrooms are less important, although care should be taken not to block too much sun."*
- 9.45** Only residential properties and schools have been considered by the sunlight assessment. Offices and retail spaces are not considered sensitive receptors to sunlight amenity. As per the BRE Guidelines, non-habitable rooms such as circulation spaces and bathrooms have also not been considered.
- 9.46** The BRE Guidelines state in Section 3.2.3:
- "To assess loss of sunlight to an existing building it suggested that all main living rooms of dwellings, and conservatories, should be checked if they have a window facing within 90° of due south."*
- 9.47** In regard to existing neighbouring receptors, the BRE Guidelines advise that 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 (21st September to 21st March) and less than 0.8 times its former sunlight hours during either period.
- 9.48** As is often the case, it is not possible to determine the room uses within each of the neighbouring properties, nor is it clear which window should be considered as the 'main window'. Therefore, all windows facing the site, serving rooms that have been identified as habitable, and within 90 degrees of due south have been considered in the assessment (unless research dictates otherwise).

Overshadowing

Sun Hours on Ground

- 9.49** The sun hours on ground (SHOG) assessment considers the proportion of a designated amenity space which receives two hours of direct sunlight on the 21st March. The BRE Guidelines provide numerical criteria for the sun hours on ground assessment; where the results show compliance, the potential effect will be negligible and not significant.
- 9.50** Using specialist software, the path of the sun is tracked. This maps obstructions and compares them to the known sun paths to determine where the sun would reach the ground and where it would not.
- 9.51** The BRE Guidelines recommend that for a garden or amenity area to appear adequately sunlit throughout the year, no more than half (50%) of the area should be prevented by buildings from receiving two hours of sunlight on the 21st March, between the hours of 7am-5pm.
- 9.52** The BRE Guidelines suggest that if, as a result of new development, an existing garden or amenity area does not meet the Guidance, or the area which can receive some sun on the 21st March is less than 0.8 times its former value then the loss of sunlight is likely to be noticeable.
- 9.53** Both public and private amenity space (considered sensitive to the Proposed Development) located to the north, east, west and south west has been assessed (for list of areas, see section 'Receptor and Sensitivity').
- Transient Overshadowing**
- 9.54** The BRE Guidelines suggest that where large buildings are proposed which may affect a number of gardens or open spaces in the surrounding area, it is useful and illustrative to plot a shadow plan to show the location of shadows at different times of the day and year. This can be done by using the Sun Hours on Ground indicator in reverse.
- 9.55** For the purpose of this assessment, the overshadowing has been mapped for the following three key dates in the year, at hourly intervals throughout the day:
- 21st March (Spring Equinox) - 7.00am-7.00pm;
 - 21st June (Summer Solstice) - 5.00am-7.00pm; and
 - 21st December (Winter Solstice) - 7.00am-5.00pm.

- 9.56 The period of September 21st (Autumn Equinox) provides the same overshadowing images as March 21st (Spring Equinox), as the sun follows the same path at these corresponding times of year.

Table 9.1 BRE Daylight, Sunlight and Overshadowing Guidance in the Assessment

Category	Criteria
Daylight - VSC	A window may be affected if the vertical sky component (VSC) measured at the centre of the window is less than 27% and less than 0.8 times its former value.
Daylight - NSL	A room may be adversely affected if a significant area of the room is beyond the No-Sky Line (NSL) and is less than 0.8 times its former value.
Sunlight	A window may be adversely affected if a point at the centre of the window receives in the year less than 25% of the annual probable sunlight hours, including at least 5% of the annual probable sunlight hours (APSH) during the winter months (21st September to 21st March) and less than 0.8 times its former sunlight hours during either period.
Overshadowing	For it to appear adequately sunlit throughout the year at least half of a garden or amenity area should receive at least two hours of sunlight on 21st March. If as a result of new development an existing garden or amenity area does not meet the above, and the area which can receive two hours of sun on 21st March is less than 0.8 times its former value, then the loss of light is likely to be noticeable. If a detailed calculation cannot be carried out, it is recommended that the centre of the area should receive at least two hours of sunlight on 21st March. Where the results show compliance with the BRE Guidelines, there is no impact and resultant effect as users of the space will be unlikely to notice any change in the sunlight amenity levels.

Methodology – Assessment Scenarios

- 9.57 Technical analysis of the Proposed Development has been undertaken using specialist computer software applied to the 3D AutoCAD computer model for the following two scenarios:
- Existing Baseline Condition:
 - Assessment of the 'existing' context, or 'baseline condition', as represented within Figure 9.1 (showing the 3D representation of the existing baseline scenario (including the site and surrounding built context));
 - Development Scenario: Existing Baseline Condition 'v' The Proposed Development:
 - A 3D model of the Proposed Development has been inserted into the baseline condition / context model to be assessed.
- 9.58 To undertake the cumulative effect assessment, consideration has been given to the surrounding Committed Developments identified (refer **ES Chapter 2 – EIA Methodology (Volume 1)**), in terms of their proximity to the site. Of the schemes identified, only the hotel application ('Hotel Development') (located adjacent to the site) has been included for assessment, as the other Committed Developments are considered to be of sufficient distance (>150m) and to the north of the site to not require assessment. Therefore, the below assessment scenario has been adopted:
- Cumulative Assessment: Existing Baseline Condition 'v' The Proposed Development + Committed Developments

Receptor Sensitivity

- 9.59 In terms of sensitivity, nearby existing residential dwellings (receptors) are considered highly sensitive to daylight and sunlight levels, and specifically habitable rooms within the properties such as living rooms, kitchens and bedrooms, in accordance with the BRE Guidelines. All existing residential receptors assessed are considered highly sensitive due to the expectation of natural light and are given equal weighting, and therefore each individual receptor is not assigned a level of sensitivity as per general EIA methodology i.e. high, medium, low or very low (see **ES Volume 1: Chapter 2 – EIA Methodology**).
- 9.60 Commercial spaces such as offices and retail areas are not considered sensitive receptors and are therefore not assessed.
- 9.61 For transient overshadowing, all public and private areas of open space such as playgrounds, playing fields, parks, squares and gardens in close proximity to the site are considered highly sensitive within the assessment.
- 9.62 The daylight, sunlight and overshadowing amenity for the residential dwellings within the Proposed Development has been considered and it was concluded that the Proposed Development makes good use of the daylight and sunlight potential available to the Site, given the Site context and the need to make efficient use of the land to provide much needed housing, whilst offering a range of other amenities, including open

space, public and private, retail and community uses. The associated report can be presented within ES Volume 3: Appendix - DSO (Annex 8).

Nature and Scale of Effect (and Effect Significance)

- 9.63 As the approach is to categorise all existing residential receptors being assessed as highly sensitive (not assign a level of sensitivity as per general EIA methodology), this results in the assessment of the magnitude of impact being synonymous with the determining the scale of effect. Therefore, the key terminology used to describe the scale of an effect is as follows:
- Major;
 - Moderate;
 - Minor; and
 - Negligible.
- 9.64 More information on how the scale of effect has been determined for each type of assessment being undertaken has been discussed in the following sections of this chapter.
- 9.65 The nature of the effects may be either adverse (negative or detrimental) or beneficial (advantageous or positive).
- ## Effect Significance
- 9.66 Windows that have low existing levels of sky visibility are vulnerable to large percentage alterations, which are often unavoidable with even modest proposed massing. It should be noted that large percentage changes do not always equate to large perceptible alterations in light.
- 9.67 The criteria used to determine likely significant effects are based on the recommendations presented in the BRE Guidelines, in addition to professional judgement. The overall effect on a receptor is based on the statistical data, taking all relevant factors, such as proportion of windows/rooms effected, percentage alterations, absolute changes, environmental context and any mitigating factors into consideration to determine whether the scale of effects are major, moderate, minor, or negligible, and the nature is either beneficial or adverse.
- 9.68 There are no set criteria for beneficial effects; it is generally regarded that the Proposed Development introduces new massing and therefore has a degree of impact (adverse) on surrounding existing receptors. However, for the purpose of this chapter a beneficial effect occurs if the receptor would be more favourable when compared with the baseline.
- 9.69 It should be noted that the numerical values quoted in the BRE Guidelines are purely advisory. The guidance for the criteria to determine the likely effects should not be applied mechanically, taking all relevant factors (such as environmental context) when determining the scale of an effect and whether an effect is significant or not. Numerical analysis, guidance notes and professional judgement has been used to determine the scale and nature of effects and so ultimately, their significance.
- 9.70 The BRE Guidelines do not advise on the significance of an effect but where an effect exceeds of the guidance, it is considered significant, as such minor, moderate and major alterations are considered 'significant' and negligible alterations are considered 'not significant'.
- 9.71 Tables 8.2 and 8.3 present the numerical values which have been used for the VSC and NSL significance criteria for existing sensitive residential properties surrounding the site, based on the recommendations in the BRE Guidelines.

Table 9.2 VSC Criteria – Scale of Effect

Scale and Nature of Effect	Numerical Criteria
Negligible	≥27% VSC and/or reduction ≤ 20%
Minor	Reduction between 20.1% and 29.99% VSC
Moderate	Reduction between 30% and 39.99% VSC
Major	Reduction above 40% VSC

Table 9.3 NSL Criteria – Scale of Effect

Scale of Effect	Numerical Criteria
Negligible	Reduction $\leq$ 20% NSL
Minor	Reduction between 20.1% and 29.99% NSL
Moderate	Reduction between 30% and 39.99% NSL
Major	Reduction above 40% NSL

9.72 When assigning the scale of an effect to each property, consideration needs to be given to:

- The number of rooms / windows affected;
- The nature of room uses affected (bedrooms, kitchens, or living rooms);
- The percentage alterations to daylight levels (very low existing levels of VSC, NSL or APSH can result in large percentage changes that may not result in perceptible changes of light);
- The absolute changes to daylight levels;
- Existing daylight levels;
- Retained daylight levels;
- Window orientation; and
- The presence of balconies, overhangs or other existing design features.

9.73 In addition, in dense urban locations there is often an existing obstruction angle of 50 degrees, and in such situations, this results in an associated VSC value in the region of 13% (*Table F1, Appendix F, BRE Guidelines*). Therefore, a retained VSC around the mid-teens is considered to be commensurate in an urban context, GVA consider this to be around circa 15%/16% (compared with the 27% VSC recommended target in the BRE Guidelines, which are predicated upon a more suburban type environment). This has been further acknowledged during the recent Whitechapel Estate development appeal⁸ in which the inspector's decision letter dated 21st February 2018 stated the following:

"112. The figures show that a proportion of residual Vertical Sky Component ('VSC') values in the mid-teens have been found acceptable in major developments across London. This echoes the Mayor's endorsement in the pre- SPG decision at Monmouth House, Islington that VSC values in the mid-teens are acceptable in an inner urban environment."

9.74 Furthermore, whilst the BRE implies that NSL of at least 80% would be considered sufficiently lit, in an urban context, daylight distribution (NSL) of 50% and over could be considered adequate.

9.75 Therefore, the guidance summarised in VSC and NSL BRE Guidance criteria tables should not be applied mechanically, in consideration of the above when determining the scale of an effect and so whether an effect is significant or not.

Sunlight Criteria

9.76 Table 9.4 below presents the numerical values which have been used as sunlight significance criteria for relevant sensitive residential properties surrounding the site, based on the recommendations in the BRE Guidelines.

Table 9.4 APSH Criteria – Scale of Effect

Scale of Effect	Numerical Criteria
Negligible	$\geq$ 25% Total APSH, of which $\geq$ 5% during winter months and/or reduction $\leq$ 20% APSH
Minor	Reduction between 20.1% and 29.99% APSH
Moderate	Reduction between 30% and 39.99% APSH
Major	Reduction above 40% APSH

Overshadowing Criteria

Sun Hours on Ground Overshadowing

9.77 In relation to external neighbouring amenity areas, the effect to those which receive two hours or more of direct sunlight to over 50% of their area on the 21st March and/or experience an alteration of less than or equal to 20% will be considered negligible and so not significant.

9.78 The methodology for assessing sun hours on ground for internal receptors is identical to that for external receptors but as it is not a comparative assessment the results are described in relation to absolute levels of direct sunlight received and no alterations. Therefore, the effect to those which receive two hours or more of direct sunlight to over 50% of their area on the 21st March will be considered negligible and so not significant.

9.79 The assessment of the scale of adverse effects to those spaces that do not receive two hours or more of direct sunlight to over 50% of their area on the 21st March is based on the above guidance, context, and professional judgement. Table 9.5 presents the numerical values which have been used for the overshadowing significance criteria.

Table 9.5 Overshadowing Criteria – Scale of Effect

Scale of Effect	Numerical Criteria
Negligible	Reduction $<$ 20% of area with 2 hours sunlight
Minor	Reduction between 20.1% and 29.99% of area with 2 hours sunlight
Moderate	Reduction between 30% and 39.99% of area with 2 hours sunlight
Major	Reduction above 40% of area with 2 hours sunlight

Transient Overshadowing

9.80 The BRE Guidelines do not provide specific criteria for the significance of transient overshadowing other than to identify the different times of the day and year when shadow would be cast over a surrounding area.

9.81 The assessment of potential adverse or beneficial effects as a result of transient overshadowing are therefore based on professional judgement, taking into consideration the baseline conditions of the site and surrounding area, and comparing these conditions against the effect of the transient overshadowing arising from the Proposed Development.

9.82 Windows that have low existing levels of sky visibility are vulnerable to large percentage alterations, which are often unavoidable with even modest proposed massing. It should be noted that this does not always equate to large perceptible alterations in light.

Receptors and Sensitivity

Daylight/Sunlight Receptors

9.83 Analysis has focussed on sensitive residential properties that are in sufficient proximity to the site for their daylight and sunlight amenity to be potentially impacted by the Proposed Development these properties are listed in Table 9.6 below.

9.84 Whilst the BRE Guidelines are not intended to be used for the assessment of commercial properties, they do state that they may be applied to non-domestic land uses where the occupants may have a reasonable expectation of daylight, such as schools, hospitals, hotels and places of worship.

Table 9.6 Sensitive Residential Receptors

Receptor Number	Receptor Description (identified in red within Figure 9.2)
1	40-42 Oxford Road
2	38 Oxford Road
3	McIlroys Building
4	61-62 St Mary's Butts
5	59-60 St Mary's Butts

⁸ Appeal Ref: APP/E5900/W/17/3171437 Appeal Decision 21 February 2018 Brendan Lyons, Inspector appointed by the Secretary of State

Receptor Number	Receptor Description (identified in red within Figure 9.2)
6	58 St Mary's Butts
7	57 St Mary's Butts
8	55-56 St Mary's Butts
9	2-6 Castle Street
10	8 Castle Street
11	16 Castle Street
12	15 Queens Walk (Queens Court)

Overshadowing Receptors

9.85 Surrounding areas of public amenity space have been identified for the sun hours on ground and transient overshadowing assessments these areas have been identified please see Table 9.7 below and Figure 9.3. We have not identified any private amenity area.

Table 9.7 Overshadowing Receptors (Amenity Areas)

Amenity Area Number	Receptor Description (outlined and shaded blue and numbered Figure 9.3)
1	Public space - pedestrian shopping street - Oxford Road
2	Public space - pedestrian shopping street - Queens Walk
3	Queens Walk Public amenity space (adjacent to Queens Walk, the south of site)
4 and 5	Public space - pedestrian shopping street - Hosier Street
6	Public space - pedestrian shopping street - St Mary's Butts

Figure 9.2 Location of Sensitive Receptors for Daylight Assessment



Figure 9.3 Location of Sensitive Receptor location for Overshadowing



BASELINE CONDITIONS

9.86 A scope of 12 properties has been assessed, giving rise to 547 windows serving 273 rooms which have been assessed for daylight and 424 windows have been assessed for sunlight. A summary of the Baseline scenario results is set out below and outlined in Table 9.8. The full set of baseline daylight, sunlight and overshadowing results are provided in **ES Volume 3: Appendix – DSO: Annex 3**.

Daylight

9.87 A total of 322 (59%) of the 547 windows assessed enjoy a VSC of 27% or above and as such meet the BRE Guidelines recommended criteria for VSC.

9.88 A total of 210 (75%) of the 273 rooms assessed enjoy a NSL of 80% or above and as such meet the BRE Guidelines recommended criteria for NSL.

Sunlight

9.89 With regard to sunlight, of the 424 windows assessed, 323 (76%) meet the BRE Guidelines achieving at least 5% or more winter and 25% or more total sunlight in the baseline condition.

Table 9.8 Baseline for Daylight and Sunlight

Receptor Address	Daylight			Sunlight		
	Total No. Windows	Total No. Windows that achieve $\geq 27\%$	Total No. Rooms	Total No. Rooms that achieve $\geq 80\%$ NSL	Total No. Windows	Total No. Windows that achieve $\geq 25\%$ Total and $\geq 5\%$ Winter sunlight
40-42 Oxford Road	12	0	6	6	12	12
38 Oxford Road	92	23	12	8	74	23
McIlroys Building	197	175	67	55	197	176
61-62 St Mary's Butts	10	10	6	3	10	6
59-60 St Mary's Butts	6	6	6	2	6	6

Receptor Address	Daylight			Sunlight		
	Total No. Windows	Total No. Windows that achieve $\geq 27\%$	Total No. Rooms	Total No. Rooms that achieve $\geq 80\%$ NSL	Total No. Windows	Total No. Windows that achieve $\geq 25\%$ Total and $\geq 5\%$ Winter sunlight
58 St Mary's Butts	4	4	4	0	4	4
57 St Mary's Butts	2	2	2	0	2	2
55-56 St Mary's Butts	14	14	10	6	14	14
2-6 Castle Street	4	0	4	0	0	0
8 Castle Street	1	1	1	1	0	0
16 Castle Street	12	7	11	5	0	0
15 Queens Walk (Queens Court)	193	80	144	124	105	80
Totals	547	322	273	210	424	323
Totals (%)	N/A	59%	N/A	75%	N/A	76%
*N/A means that no windows within the property are relevant for the sunlight assessment (i.e. no windows face within 90° of due south)						

Overshadowing

- 9.90 The BRE Guidelines criteria for Overshadowing recommend that amenity areas achieve 2 hours direct sunlight to 50% of the area (SHOG). The amenity areas (Table 9.7) have been assessed to understand which achieve 2 hours of direct sunlight to 50% of their area and as such meet the BRE Guidelines recommendation. A total of 4 of the 5 amenity areas adhere to the BRE recommendation in the existing condition, the remaining area, Amenity Area 6, achieves 2 hours of direct sunlight to 30% of the area and therefore is considerably short of BRE Guideline recommendation (50%).

POTENTIAL EFFECTS

Completed Development

Daylight

- 9.91 Full drawings of the existing baseline and site are located in ES Volume 3: Appendix: DSO (Annex 2).
- 9.92 Figure 9.4 below illustrates a 3D image of the Proposed Development, in the surrounding existing context.
- 9.93 The full daylight technical assessment is located within **ES Volume 3: Appendix DSO – Annex 2**. A summary of this data is presented in Table 9.8 below.
- 9.94 In total 547 windows serving 273 rooms were assessed within 12 neighbouring properties.
- 9.95 In relation to VSC, 416 (76%) of the 547 windows assessed would meet the BRE Guidelines. Furthermore, 489 windows (89%) will either meet the BRE criteria for VSC or experience a **Minor Adverse** effect.
- 9.96 44 windows (8%) will experience a **Moderate Adverse** effect and 14 windows (3%) will experience a **Major Adverse** effect.
- 9.97 In terms of NSL, 254 (93%) of the 273 rooms assessed, will meet the BRE criteria for NSL and 13 will experience a **Minor Adverse** effect.
- 9.98 2 rooms (<1%) will experience a **Moderate Adverse** effect.
- 9.99 The 4 remaining rooms which experience a **Major Adverse** effect in NSL represent only 1.5% of the overall 273 rooms assessed. The four rooms in question are located at 59-60 St Mary's Butts and 3 of these are notably deep at 7-9m's (see contour drawings BRE 97) meaning a greater movement of the skyline may be unavoidable (BRE Guidelines 2.2.10). The fourth is a bedroom which is considered less sensitive in relation to daylight amenity. Furthermore, It is not confirmed whether the associated planning application was implemented as such the layouts are considered to represent a worst case scenario.

- 9.100 Overall, 6 properties (50%) highlighted grey within Table 9.9 below would not experience a noticeable alteration in the levels of daylight (VSC and NSL) they receive with the completed Proposed Development site in place in so far as the significance criteria does not alter.

- 9.101 Therefore, it is considered that these properties would experience a **Negligible** effect, which is considered not significant.

- 9.102 The remaining 6 properties that would experience noticeable effects and are discussed in more detail below.

Mcilroys Building

- 9.103 A total of 197 windows serving 67 rooms were assessed for daylight within this mixed-use building.

- 9.104 For VSC, 92 (47%) of the windows assessed would meet the BRE criteria and are considered to experience a **Negligible** effect.

- 9.105 Of the 105 windows (53%) that fall below the recommended BRE VSC criteria, 47 windows will experience alterations between 20%-29.9%, which is considered a minor adverse effect and 44 windows will experience alterations between 30%-39.9%, which is considered a **Moderate Adverse** effect.

- 9.106 Of the 91 windows experiencing **Minor** to **Moderate** adverse alterations in VSC of between 20%-39.9%, 87 retain a VSC between 19%-26.9%, which is in excess of the 'mid-teens' considered to be commensurate with an urban location. 3 of the remaining windows retain VSC's between 9-14% and serve rooms which contain additional windows and retain NSL levels in excess of 80%; The remaining room retains a VSC of >14% and serves a bedroom which is considered to be less sensitive and retains a NSL of 96%.

- 9.107 The remaining 14 windows that fall below the recommended BRE criteria will experience alterations in excess of 40%VSC, which is considered a **Major Adverse** effect. However, 13 of these retain a VSC between 18-19% which is in excess of the mid-teens' considered commensurate for an urban location. The remaining window does experience a reduction >40% however the room is served by three additional windows which retains a VSC of 14%, and the room retains an NSL of 97% meaning a view of the sky will be maintained for almost the entirety of the room.

- 9.108 For NSL, 60 (91%) of the 67 rooms assessed would meet the BRE criteria and are considered to experience a **Negligible** effect.

Figure 9.4 Proposed Development in existing surrounding context



- 9.109 Of the 7 rooms that fall below the recommended BRE criteria, 6 will experience alterations between 20%-29.99%, which is considered a **Minor Adverse** effect. 6 of these rooms serve bedrooms which are considered less sensitive and the other serves an LKD but retain a NSL of 70% meaning the sky will be visible from nearly ¾ of the room area.
- 9.110 The remaining room will experience an alteration of 30% which is considered a **Moderate Adverse** effect, however the room retains a NSL of 65% and furthermore the two windows which serve the room retain VSC levels in excess of the BRE recommendation.

Table 9.9 Summary of VSC and NSL Levels with the Proposed Development

Receptor Address	Total No. Windows	No. Windows that meet BRE criteria for VSC (≥27% VSC and/or ≤20% alteration)	%	Below BRE Guidelines			Total No. Windows below BRE Guidelines	%	Total No. Rooms	No. Rooms that meet BRE criteria for NSL (≤20% alteration)	%	Below BRE Guidelines			Total No. Rooms below BRE Guidelines	%
				>20 - <29.99% alteration	≥30 - <39.99% alteration	≥40% alteration						>20 - <29.99% alteration	≥30 - <39.99% alteration	≥40% alteration		
40-42 Oxford Road	12	12	100%	0	0	0	0	0%	6	6	100%	0	0	0	0	0%
38 Oxford Road	92	92	100%	0	0	0	0	0%	12	12	100%	0	0	0	0	0%
Mcilroys Building	197	92	47%	47	44	14	105	53%	67	60	90%	6	1	0	7	10%
61-62 St Mary's Butts	10	10	100%	0	0	0	0	0%	6	3	50%	2	1	0	3	50%
59-60 St Mary's Butts	6	6	100%	0	0	0	0	0%	6	2	33%	0	0	4	4	67%
58 St Mary's Butts	4	4	100%	0	0	0	0	0%	4	0	0%	4	0	0	4	100%
57 St Mary's Butts	2	2	100%	0	0	0	0	0%	2	2	100%	0	0	0	0	0%
55-56 St Mary's Butts	14	14	100%	0	0	0	0	0%	10	9	90%	1	0	0	1	10%
2-6 Castle Street	4	4	100%	0	0	0	0	0%	4	4	100%	0	0	0	0	0%
8 Castle Street	1	1	100%	0	0	0	0	0%	1	1	100%	0	0	0	0	0%
16 Castle Street	12	12	100%	0	0	0	0	0%	11	11	100%	0	0	0	0	0%
15 Queens Walk (Queens Court)	193	167	87%	26	0	0	26	13%	144	144	100%	0	0	0	0	0%
Totals	547	416	N/A	73	44	14	131	N/A	273	254	N/A	13	2	4	19	N/A
Totals (%)	N/A	76	N/A	13	8	3	24	N/A	N/A	93	N/A	5	1	1	7	N/A

*Properties highlighted in grey comply with both the VSC and NSL Daylight criterion and therefore will experience a **negligible** impact

61-62 St Mary's Butts

- 9.112 A total of 10 windows serving 6 rooms were assessed for daylight within this mixed-use building.
- 9.113 For VSC, all 10 windows (100%) would meet the BRE criteria and are therefore considered to experience a **Negligible** effect.
- 9.114 For NSL, 3 (50%) of the 6 rooms assessed would meet the BRE criteria and are considered to experience a **Negligible** effect.
- 9.115 Of the 3 rooms that fall below the recommended BRE criteria for NSL, 2 will experience alterations between 20%-29.99%, which is considered a **Minor Adverse** effect and the remaining room will experience alterations of 30%-39.9%, which is considered a **Moderate Adverse** effect; However all three rooms retain NSL values in excess of 66% and furthermore, windows to these rooms retain VSC in excess of the BRE criteria.
- 9.116 In consideration of the above, overall the effect to daylight within this residential property is considered to be **Minor Adverse**.

59-60 St Mary's Butts

- 9.117 A total of 6 windows serving 6 rooms were assessed for daylight within this mixed-use building.

- 9.111 In consideration of the above and the retained daylight values, overall the effect to daylight within this residential property is considered to be **Minor to Moderate Adverse**.

- 9.118 For VSC, all 6 windows (100%) would meet the BRE criteria and are therefore considered to experience a **Negligible** effect.

- 9.119 For NSL, 2 (33%) of the 6 rooms assessed would meet the BRE criteria and are considered to experience a **Negligible** effect.

- 9.120 Of the 4 rooms that fall below the recommended BRE criteria, all 4 will experience alterations of >40% which is considered **Major Adverse**. Of these four rooms, 3 are notably deep at 7-9m's (see contour drawing BRE 97 located within ES Volume 3: Appendix - DSO (Annex 4). The BRE Guidelines (2.2.10) state where 'rooms lit from one side only and greater than 5m deep, then a greater movement of the no sky line may be unavoidable'. The fourth room is a bedroom which is considered less sensitive in relation to daylight amenity. Furthermore, it is not confirmed whether the associated consented planning application⁹ was implemented as such the layouts are considered to represent a worst case scenario.

- 9.121 In consideration of the above, overall the effect to daylight within this residential property is considered to be a **Moderate Adverse** effect.

58 St Mary's Butts

- 9.122 A total of 4 windows serving 4 rooms were assessed for daylight within this mixed-use building.

⁹ Planning Application Number : 140784

9.123 For VSC, all 4 windows (100%) would meet the BRE criteria and are therefore considered to experience a **Negligible** effect.

9.124 For NSL, all 4 rooms experience alterations between 20%-29.99%, which is considered a **Minor Adverse** effect however all rooms retain a view of the sky for more than 50% of the room area and further the windows to these rooms retain a VSC in excess of the BRE Criteria.

9.125 In consideration of the above, overall the effect to daylight amenity within this residential property is considered to be **Minor Adverse**.

55-56 St Mary's Butts

9.126 A total of 14 windows serving 10 rooms were assessed for daylight within this mixed-use building.

9.127 For VSC, all 14 windows (100%) would meet the BRE criteria and are therefore considered to experience a **Negligible** effect.

9.128 For NSL, of the 10 rooms assessed 9 (90%) would meet the BRE criteria and are considered to experience a **Negligible** effect.

9.129 The 1 room that falls below the recommended BRE criteria will experience alterations of 21% which is technically a **Minor Adverse** with reference to the significance criteria effect although this is only marginally beyond the BRE alteration threshold of 20%.

9.130 In consideration of the above, overall the effect to daylight within this residential property is considered to experience a **Negligible** effect.

15 Queens Walk (Queens Court)

9.131 A total of 193 windows serving 144 rooms were assessed for daylight within this mixed-use building.

9.132 For VSC, 167 windows (85%) would meet the BRE criteria and are therefore considered to experience a **Negligible** effect.

9.133 Of the 26 windows that fall below the recommended BRE criteria, all 26 will experience alterations between 20%-29.99%, which is considered a **Minor Adverse** effect; 9 of these retain a VSC between 15-16% which is considered commensurate with an urban location. A further 5 are understood to be bedrooms which are considered less significant. A further 8 rooms experience a minor adverse alteration in VSC however the room they serve retains an NSL value of 75% or above, which is marginally short of the BRE recommendation of 80%.

9.134 For NSL, all 144 (100%) rooms assessed would meet the BRE criteria and are considered to experience a **Negligible** effect.

9.135 In consideration of the above, overall the effect to daylight within this residential property is considered to be **Minor Adverse**.

Sunlight

9.136 The full sunlight assessment is presented within **ES Volume 3: Appendix - DSO (Annex 3)**.

9.137 A total of 424 windows have been assessed for sunlight within 9 neighbouring properties that are relevant for the sunlight assessment.

9.138 Of the 424 windows assessed, 345 (81%) would meet the BRE criteria for both winter and annual sunlight (APSH).

9.139 In relation to winter sunlight, 382 (90%) meet the BRE criteria.

9.140 Of the 42 windows that do not meet the BRE criteria for Winter Sunlight, 2 experience a **Minor Adverse** effect, 3 experience a **Moderate Adverse** effect and 37 experience a **Major Adverse** effect.

9.141 In relation to annual sunlight (APSH) 372 (90%) meet the BRE criteria.

9.142 Of the 52 (12%) that do not meet the BRE criteria (APSH), 24 experience an alteration between 20-29% which is considered to be a **Minor Adverse** effect.

9.143 Of the remaining 28 windows (7%), 9 (2%) experience an alteration between 30- 40% which is considered to be a **Moderate Adverse** effect. 24 (6%) experience an alteration change above 40% which is considered to be an **Major Adverse** effect.

9.144 Overall, 5 out of 9 properties will meet BRE Criteria for winter and annual sunlight.

9.145 The 4 properties which experience adverse effects are discussed below.

38 Oxford Road

9.146 74 windows within this property are relevant for the sunlight assessment.

9.147 Of these, 43 windows (58%) will meet the BRE Guidelines for both total and winter sunlight.

9.148 With regard winter sunlight, 51 (69%) meet BRE Criteria.

9.149 3 windows will experience an alteration between >30-<39.99% which is **Moderate** significance. Whilst there is a technical alteration of >30%-39%, the low existing levels of 1-3% WPSH mean a loss of c.1% WPSH results in a percentage change of >30% which is considered disproportionately large relative to the alteration.

9.150 20 windows (27%) will experience an alteration beyond 40% in winter sunlight, which is technically a **Major Adverse** effect. 8 have a WPSH of 5% or below in the existing condition and therefore the losses of 1-3% WPSH seen at these windows percentage change of >30% which is considered disproportionately large relative to the alteration.

9.151 The remaining 12 rooms experience an alteration beyond >40% but retain a WPSH of 3-4% which is marginally below the BRE recommendation of 5%WPSH.

9.152 In terms of total sunlight (APSH) 60 windows (80%) will comply with the BRE Guidelines for annual probable sunlight hours and retain over 26% APSH. As such, these windows should receive acceptable sunlight amenity throughout the course of the year.

9.153 Of the 14 windows that do not meet APSH criteria, 9 will experience an alteration of 20-29% considered to be a **Minor** effect. 3 windows will experience an alteration of 30-39%, considered to be a **Moderate** effect. 2 windows will experience an alteration of >40% and this is considered to be a **Major** effect. However, these windows achieve either just on or below the recommended 5% for winter sunlight in the existing context.

9.154 It is worth noting that the building is a period property and exhibits deep reveals which are considered to be artificially limiting direct sunlight access to the property and therefore exacerbating the alteration of sunlight seen in the technical analysis.

9.155 In consideration of the retained levels of APSH, the effect to sunlight amenity within this property is considered to be **Moderate** adverse.

Mcllroys Building

9.156 197 windows at this building have been assessed for sunlight. 161 (82%) meet the BRE criteria for both winter and total sunlight. As such, these windows should receive acceptable sunlight amenity throughout the course of the year.

9.157 With regard to winter sunlight, 180 (91%) meet the BRE criteria.

9.158 The 17 windows which do not meet the BRE Criteria for winter sunlight experience a change of 40% or more which is considered a **Major Adverse** effect.

9.159 8 of these windows experience an alteration of >40% although retain a WPSH of 3-4% which is considered close to the BRE recommendation of 5%.

9.160 In terms of total sunlight (APSH) 169 windows (86%) will comply with the BRE Guidelines for annual probable sunlight hours and retain over 26% APSH. As such, these windows should receive acceptable sunlight amenity throughout the course of the year.

9.161 28 windows do meet the BRE criteria for annual sunlight. 10 of these experience an alteration of >20-< 29.99%, considered to be a **Minor** impact.

9.162 Of these 28 windows, 6 windows experience an alteration of >30-<39.99%, considered to be **Moderate** impact. However, 4 of these windows retain an APSH of 20% or above which is considered close to the BRE recommendation of 25% APSH. In relation to the other 2 windows which see a moderate alteration, one serves a bedroom where sunlight amenity is not considered as significant compared to other room uses this bedrooms also contains an additional window which retains an APSH of 18%. The remaining window serves an LKD and retains an APSH of 18%.

9.163 12 windows experience an alteration of >40% APSH, which is considered a **Major Adverse** impact. 5 of these windows serve bedrooms which are considered to be less significant for sunlight amenity compared to other room uses.

- 9.164** The remaining seven rooms do experience an alteration of >40 APSH however all seven serve rooms which contain additional windows where the BRE recommendation of 25% APSH is achieved.
- 9.165** In consideration of the above and in particular retained levels of APSH, the effect to sunlight amenity within this property is considered to be **Minor Adverse**.
- 61-62 St Mary's Butts*
- 9.166** 10 windows within this property have been assessed for Sunlight. 8 of which meet the criteria for winter and total sunlight. As such, these windows should receive acceptable sunlight amenity throughout the course of the year.

- 9.167** With regard to winter sunlight, 8 windows meet the BRE criteria.
- 9.168** The 2 windows that do not meet winter criteria experience an alteration of >20 - <30% which is a technical breach of the BRE criteria. However both experience an absolute change of only 1% WPSH however a disproportionate percentage reduction is created due to the existing WPSH value being 4%.
- 9.169** In relation to total sunlight, all windows meet the BRE criteria.
- 9.1** In consideration of the above, the effect to sunlight amenity within this property is considered to be a **Negligible** to **Minor Adverse**.

Table 9.10 Summary of APSH levels with the Proposed Development

Receptor Address	Total No. Windows	No. Windows that meet Total & Winter BRE criteria for Sunlight (≥5% winter and/or ≤20% alteration AND ≥25% total and/or ≤20% alteration)	%	No. Windows that meet Winter BRE criteria for Sunlight (≥5% winter and/or ≤20% alteration)	%	Below BRE Guidelines for Winter Sunlight			Total no. Windows below BRE Guidelines for Winter Sunlight	%	No. Windows that meet Total BRE criteria for Sunlight (≥25% total and/or ≤20% alteration)	%	Below BRE Guidelines for Total Sunlight			Total no. Windows below BRE Guidelines for Total Sunlight	%
						>20 - <29.99% alteration	≥30 - <39.99% alteration	≥40 alteration					>20 - <29.99% alteration	≥30 - <39.99% alteration	≥40 alteration		
40-42 Oxford Road	12	12	100%	12	100%	0	0	0	0	0%	12	100%	0	0	0	0	0%
38 Oxford Road	74	43	58%	51	69%	0	3	20	23	31%	60	81%	9	3	2	14	19%
Mcilroys Building	197	161	82%	180	91%	0	0	17	17	9%	169	86%	10	6	12	28	14%
61-62 St Mary's Butts	10	8	80%	8	80%	2	0	0	2	20%	10	100%	0	0	0	0	0%
59-60 St Mary's Butts	6	6	100%	6	100%	0	0	0	0	0%	6	100%	0	0	0	0	0%
58 St Mary's Butts	4	4	100%	4	100%	0	0	0	0	0%	4	100%	0	0	0	0	0%
57 St Mary's Butts	2	2	100%	2	100%	0	0	0	0	0%	2	100%	0	0	0	0	0%
55-56 St Mary's Butts	14	14	100%	14	100%	0	0	0	0	0%	14	100%	0	0	0	0	0%
15 Queens Walk (Queens Court)	105	95	90%	105	100%	0	0	0	0	0%	95	90%	5	0	5	10	10%
Totals	424	345	N/A	382	N/A	2	3	37	42	N/A	372	N/A	24	9	19	52	N/A
Totals (%)	N/A	81%	N/A	90%	N/A	0%	1%	9%	10%	N/A	88%	N/A	6%	2%	4%	12%	N/A

**Properties highlighted in grey comply with both the Winter and Total Sunlight criterion and therefore will experience a negligible impact*

- 15 Queens Walk (Queens Court)*
- 9.170** 105 windows have been assessed at this property.
- 9.171** Of these, 95 (90%) will meet the BRE criteria for winter and total sunlight.
- 9.172** In relation to winter sunlight, all 105 (100%) windows will meet the BRE criteria for winter sunlight.
- 9.173** In terms of total sunlight (APSH) 95 windows (90%) will comply with the BRE Guidelines for annual probable sunlight hours and retain over 26% APSH. As such, these windows should receive acceptable sunlight amenity throughout the course of the year.
- 9.174** 5 windows experiences an alteration of >20-< 29.99%, considered to be a **Moderate** impact. All 5 serve rooms which have additional windows that meet the BRE criteria for VSC.

- 9.175** The remaining 5 experience an alteration of >40% and therefore the is classified as a **Major Adverse**, however each of these windows serve bedrooms which are considered less significant in terms of sunlight amenity compared to other room uses.
- 9.176** In consideration of the retained levels of APSH and context of the loss, the effect to sunlight amenity within this property is considered to be **Minor Adverse**.
- Overshadowing*
- Sun Hours on Ground*
- 9.177** The full Sun Hours on Ground (SHOG) assessment (Overshadowing) is presented within **ES Volume 3: Appendix DSO – Annex 6**.

- 9.178** A total of 6 amenity areas have been considered for the assessment. Please note that the SHOG assessment considers the effect of both the Proposed Development and the Hotel Development Proposal, as such the assessment would capture the cumulative effect and is considered a ‘worst case scenario’.
- 9.179** In summary, 5 amenity areas (1, 2, 3, 4 and 5) meet the BRE criteria for overshadowing with the Proposed Development. These areas achieve the recommended 2 hours of Sunlight to 50-c.100% of the area which is in excess of the 50% BRE recommendation. The likely effect on these areas is considered **Negligible**.
- 9.180** The area which receives 2 Hours of sunlight at Amenity Area 6 (Public space – St Mary’s Butts (pedestrian shopping street)) in the existing condition experiences an alteration of 40% which is technically a major alteration. However it is important to note that in the existing condition only 30% of the area achieves 2 hours of sunlight. As such the part affected by the Proposed Development is relatively small in relation to the overall size of the amenity area. This can be seen in drawings BRE136 within **ES Appendix DSO – Annex 6 (Volume 3)**.
- 9.181** Whilst there is a 40% change, overall in consideration of nature of the loss to Amenity Area 6 the alteration is considered to be a **Minor Adverse** effect.
- Transient Overshadowing*
- 9.182** The full Transient Overshadowing assessment is presented within **ES Volume 3: Appendix DSO – Annex 7**.
- 9.183** 6 amenity areas have been considered for the assessment of the transient overshadowing on the 21st March, 21st June and 21st December, comments in relation to each date are given below.
- 21st March*
- 9.184** In general the 6 amenity areas are considered to remain unaffected. The analysis has identified some increased shadow to Amenity Area 6 which will occur between 10am-11am, however prior and after this period the area is unaffected.
- 9.185** It is the case that in the existing condition Amenity Area 6 does not enjoy large amounts sunlight during this period, this is considered to be due to the architectural form of the existing surrounding buildings which make it difficult for sunlit to reach ground level. As such whilst the increase in shadow from the Proposed Development affects a relatively small area of the amenity space this area does represent the limited sunlit area between 10-11am.
- 9.186** Overall in consideration of the existing buildings which reduce the sunlit area in the existing condition and that the increased shadow from the Proposed Development only affects a small part of the amenity area and for a limited time, the effect upon Amenity Area 6 on 21st March is considered to be **Minor**.
- 9.187** The effect of the Proposed Development on amenity areas 1-5 is considered **Negligible** and there is considered to be a **Minor Adverse** effect to Amenity Area 6.
- 21st June*
- 9.188** With regards the 21st June assessment In general the 6 amenity areas are considered to remain unaffected with instances of increased shadow for limited periods of time. The analysis has identified some increased shadow for limited periods of time to Amenity Areas 3, 4, 5 and 6.
- 9.189** Amenity Area 3 experiences increased shadow coverage between 5pm and 6pm however remains unaffected prior and after this period. Overall in consideration the effect to the area throughout the day is considered to be **Minor Adverse**.
- 9.190** Amenity Areas 4 & 5 experience increased shadow between 6pm and 7pm although the areas remain unaffected prior and after this period.
- 9.191** Amenity Area 6, as with 21st March experiences increased shadow coverage between 10-11am. In the existing condition the sunlit area during this time is limited and as such the increased shadow does affect this remaining sun-lit area at this time. When considered over the course of the day the effect is considered to be a **Minor Adverse** impact.
- 9.192** Overall in consideration of the Transient overshadowing impact throughout 21st June the impact upon 3, 4, 5 and 6 is considered to be **Minor Adverse**. The impact upon Amenity Areas 1 and 2 is considered to be **Negligible**.
- 21st December*
- 9.193** As with the 21st March assessment, in general the 6 amenity areas remain unaffected, aside from Amenity Area 6 which experiences increased show coverage for a limited time between 10-11am.

- 9.194** In consideration of the existing buildings to the immediate south of the amenity area, which artificially reduce sunlight access in the existing condition and the limited time (circa 1 hour) in which the area is affected by the Proposed Development, the overall impact is considered to be **Minor Adverse**.

MITIGATION AND MONITORING MEASURES

Demolition and Construction

- 9.195** No technical analysis of the likely significant effects on the surrounding properties and amenity spaces during the demolition and construction phases were carried out.
- 9.196** During construction works, a number of tall cranes are likely to be on-site. The presence of such machinery is temporary, and due their proportions, any impact upon daylight, sunlight or sun-on-ground (overshadowing) amenity is likely to be very minor, and imperceptible in nature.
- 9.197** The potential effects of the construction of the Proposed Development will vary during demolition and construction and likely gradually increase to the maximum effect identified by the completed Development assessments, as the superstructure is built and then clad.
- 9.198** Please refer to the section below regarding Mitigation and Monitoring associated with the Completed Development

Completed Development

Daylight and Sunlight

- 9.199** In relation to daylight and sunlight amenity the majority of neighbouring sensitive receptors will experience negligible or minor effects with instances of moderate and major alterations.
- 9.200** Given the scale of the massing proposed and the urban context of the site, these effects are likely to be unavoidable in relation to new development. No further mitigation measures have been considered.

Overshadowing

- 9.201** Whilst there will be an alteration considered **Minor Adverse** adverse effect in terms of sun hours on ground (overshadowing) to Amenity Area 6 for a limited time, the majority of external neighbouring amenity areas identified are not likely to experience significant effects as a result of the Proposed Development.
- 9.202** Furthermore, the transient overshadowing assessment indicates that additional overshadowing is likely to be experienced only during isolated periods of the day and thus the areas should remain unaffected for the majority of the day.
- 9.203** Given the assessment, no mitigation is considered necessary to address the potential impact of overshadowing.

RESIDUAL EFFECTS

- 9.204** The residual effects resulting from the Proposed Development are summarised in Table 9.11.

Table 9.11 Summary of Residual Effects

Receptor	Receptor Sensitivity	Residual Effect (Nature and Scale)	Significance	Geo	D I	P T	R IR	St Mt Lt
Demolition and Construction								
Daylight Sunlight and Overshadowing								
Surrounding receptors, including Residential properties, Amenity areas	Refer 'Assessment Methodology – Demolition and Construction' – It is considered that the completed Proposed Development represents the worst-case assessment in terms of likely daylight, sunlight, overshadowing, solar glare and light spillage effects. Refer Residual Effects for the Completed Development (see below).							
Completed Development								
Daylight								

38, 40 -42, 60 Oxford Road	High	Negligible	Not Significant	L	D	P	IR	Lt
32, 34, 35-37, 57 St Mary's Butts	High	Negligible	Not Significant	L	D	P	IR	Lt
2-6, 8, 10, 12, 16 Castle Street	High	Negligible	Not Significant	L	D	P	IR	Lt
21-23, 58, 61 – 62 St Mary's Butts	High	Minor Adverse	Significant	L	D	P	IR	Lt
15 Queens Walk (Queens Court)	High	Minor Adverse	Significant	L	D	P	IR	Lt
59 – 60 St Mary's Butts	High	Moderate Adverse	Significant	L	D	P	IR	Lt
19 – 20 St Mary's Butts	High	Minor to Moderate Adverse	Significant	L	D	P	IR	Lt
Mcllroy's Building	High	Minor to Moderate Adverse	Significant	L	D	P	IR	Lt
Sunlight								
40-42, 60 Oxford Road	High	Negligible	Not Significant	L	D	P	IR	Lt
34, 55-56, 57, 58, 59-60 St Mary's Butts	High	Negligible	Not Significant	L	D	P	IR	Lt
2-6, 8, 10, 12 Castle Street	High	Negligible	Not Significant	L	D	P	IR	Lt
61 – 62 St Mary's Butts	High	Negligible to Minor Adverse	Significant	L	D	P	IR	Lt
Mcllroy's Building	High	Minor Adverse	Significant	L	D	P	IR	Lt
21 – 23, 32, 35-37 St Mary's Butts	High	Minor Adverse	Significant	L	D	P	IR	Lt
15 Queens Walk (Queens Court)	High	Minor Adverse	Significant	L	D	P	IR	Lt
19 – 20 St Mary's Butts	High	Moderate Adverse	Significant	L	D	P	IR	Lt
38 Oxford Road	High	Moderate Adverse	Significant	L	D	P	IR	Lt
Overshadowing								
Transient Overshadowing	High	Negligible to Minor Adverse	Significant	L	D	P	IR	Lt
Sun Hours on Ground	High	Minor Adverse	Significant	L	D	P	IR	Lt
Notes: Residual Effect Scale = Negligible / Minor / Moderate / Major Nature = Beneficial or Adverse Geo (Geographic Extent) = Local (L), Borough (B), Regional (R), National (N) D = Direct / I = Indirect P = Permanent / T = Temporary R = Reversible / IR= Irreversible St = Short Term / Mt = Medium Term / Lt = Long Term N/A = not applicable / not assessed								

LIKELY SIGNIFICANT EFFECTS

- 9.205** It should be noted that the numerical values quoted in the BRE Guidelines are purely advisory.
- 9.206** Windows that have low existing levels of sky visibility are vulnerable to large percentage alterations, which are often unavoidable with even modest proposed massing. It should be noted that this does not always equate to large perceptible alterations in light.

9.207 The criteria used to determine likely significant effects are based on the recommendations presented in the BRE Guidelines, in addition to professional judgement. The overall effect on a receptor is based on the statistical data, taking all relevant factors, such as proportion of windows/rooms effected, percentage alterations, absolute changes, environmental context and any mitigating factors into consideration to determine whether the scale of effects are major, moderate, minor, or negligible, and the nature is either beneficial or adverse.

9.208 There are no set criteria for beneficial effects; it is generally regarded that the Proposed Development introduces new massing and therefore has a degree of impact (adverse) on surrounding existing receptors. However, for the purpose of this chapter a beneficial effect occurs if the receptor would be more favourable when compared with the baseline.

9.209 The guidance for the criteria to determine the likely effects should not be applied mechanically, taking all relevant factors (such as environmental context) when determining the scale of an effect and so whether an effect is significant or not. Numerical analysis, guidance notes and professional judgement has been used to determine the scale and nature of effects and so ultimately, their significance.

9.210 Tables in **ES Volume 3: Appendix DSO – Annex 1** of this document present the likely daylight and sunlight effects in relation to the neighbouring sensitive receptors.

9.211 Significant redevelopment of buildings in urban environments is likely to cause instances of minor, moderate and major adverse impacts which are often unavoidable. Nevertheless, as a result of a number of daylight and sunlight iterative assessments the design team have evolved the design to minimise the effect on sensitive receptors where possible, this includes the orientation of 'Site E' block on Oxford Road which has been altered to a North South Axis to minimise amenity impacts to Mcllroy's buildings.

Summary

9.212 The daylight analysis indicates that the majority of neighbouring residential receptors would not experience significant effects to the levels of daylight they receive with the Proposed Development site in place. Whilst alterations are predominantly negligible, there are instances of minor, moderate and major alterations seen to windows or rooms at several properties. When considering the properties as a whole, impacts on 6 properties are considered to be negligible, a further 5 properties experience an overall effect considered minor adverse and 1 property experiences a loss considered moderate.

9.213 It has been identified that for several properties alongside the alterations to the daylight amenity, factors such as retained values, room use and architectural design features are relevant to the consideration of the overall impact to the property.

9.214 In relation to sunlight, the technical analysis has shown the effect on 4 of the 9 properties technically assessed will be negligible. There are instances of minor, moderate and major alterations to the remaining four properties. When considering the properties as a whole, 3 properties are considered to experience a **Minor** impact, 1 is considered to experience a **Minor to Moderate** alteration and the remaining a **Moderate** alteration.

9.215 With regards to the SHOG assessment, 5 out of 6 amenity areas are unaffected and therefore the impact from the Proposed Development is considered to be negligible. Amenity Area 6 does experience a reduction in the area which receives 2 hours of sunlight and overall the overshadowing (SHOG) impact is considered to be minor.

9.216 The transient overshadowing exercises have demonstrated that in general the 6 Amenity Areas will remain unaffected. The assessments have been undertaken on 21st March, 21st June and 21st December, it has been identified that some increased shadow coverage will be present for Amenity Areas 3, 4, 5 and 6 although only for limited periods of time (circa 1 hour).

9.217 Overall the transient overshadowing impact upon Amenity Areas 3, 4, 5 and 6 is considered to be **Minor** and Areas 1 and 2 is considered to be negligible.

CLIMATE CHANGE

Daylight

9.218 In accordance with the criteria set out in the BRE Guidelines, daylight analysis is carried out under an assumed overcast sky.

9.219 The methodologies used to quantify the levels of daylight are the Vertical Sky Component (VSC) and No Sky Line (NSL). Average Daylight Factor (ADF) assessments have also been undertaken and are only referred to where room layouts have been obtained and are supplementary to the VSC and NSL analysis.

9.220 VSC and ADF analysis is presented as a percentage of the total amount of light received at an unobstructed location. The NSL by contrast is a percentage of the room that can see the sky, and as such does not depend on the absolute amount of external daylight.

9.221 Therefore, the current BRE criteria and the results of the associated daylight assessments are not influenced by, nor would they be altered by climate change.

Sunlight

9.222 Sunlight is calculated by determining the quantum of Annual Probable Sunlight Hours (APSH) received in winter, and throughout the year. To do this, 100 fixed locations in the sky dome, which illustrate possible sun positions over the course of the year are modelled and assessed in both the existing and proposed scenario at the window face of neighbouring properties.

9.223 The locations of these 100 points are provided by BRE. Any change in climate would not result in more or less than the 100 APSH test points provided. Any changes to the 100 assessment points would in effect be a change in methodology and would likely be driven by the BRE.

9.224 Therefore, the current BRE criteria and the results of the associated sunlight assessments are not influenced by, nor would they be altered by climate change.

Overshadowing

9.225 Overshadowing assessment is undertaken through both Sun-House-on-Ground and Transient Overshadowing, in accordance with the BRE Guidelines. This can be undertaken on any day of the year although the equinox is most common.

9.226 The assessment assumes a day with no cloud cover and so the maximum potential sunlight is assessed. No change in climate be it less or more sunlight, will alter the effect of the analysis.

9.227 Therefore, the current BRE criteria and the results of the associated overshadowing assessments are not influenced by, nor would they be altered by climate change.

ASSESSMENT OF FUTURE ENVIRONMENT

Evolution of the Baseline Condition Scenario

9.228 It is envisaged that the existing baseline condition would largely remain in the foreseeable future, with the exception of a scheme that has been submitted to develop a site located to the south-east boundary of site ('Hotel Development'), which is currently pending decision at the time of assessment for the Proposed Development.

Cumulative Effects

9.229 A number of other Committed Developments within the surrounding area (identified in **ES Volume 1: Chapter 2: EIA Methodology**) which have been reviewed with regards to potential cumulative effects. Overall, given the distance of these Committed Developments to the site, they have not been considered relevant for inclusion as part of a cumulative assessment for daylight, sunlight and overshadowing.

9.230 The exception is a planning application for the Hotel Development, located adjacent to the site along Hosier Street. Whilst this is not yet a Committed Development (see **ES Volume 1: Chapter 2: EIA Methodology**), the scheme has been quantitatively assessed to understand the combined impact on the surrounding environment / existing receptors.

9.231 Due to the location and scale of the Hotel Development to the south east boundary of the site, the potential for cumulative impacts are limited to a portion of residential properties surrounding the site to the South West. For completeness however, the cumulative assessment has been run for all sensitive receptors (consistent with the Development Scenario).

9.232 The following section considers the daylight, sunlight and overshadowing effects of the Proposed Development in conjunction with the Hotel Development. This is referred to as the 'Cumulative Assessment'.

9.233 Full drawings of the existing baseline and Proposed Development with the Hotel Development are located in **ES Volume 3: Appendix DSO – Annex 2**.

9.234 Figure 9.5 illustrates an image of the Proposed Development and Hotel Development.

Daylight

9.235 The full daylight technical assessment is located within **ES Volume 3: Appendix - DSO (Annex 3)**.

9.236 In total 547 windows serving 273 rooms were assessed within 12 neighbouring properties.

9.237 In relation to VSC, 415 (76%) of the 547 windows assessed would meet the BRE Guidelines.

9.238 74 windows experience a **Minor Adverse** alteration; this is one more window when compared to Development Scenario. 489 windows (89%) will either meet the BRE criteria for VSC or experience a minor adverse effect, this is the same as with Development Scenario.

9.239 44 windows (8%) will experience a moderate adverse effect and 14 windows (3%) will experience a major adverse effect, which is the same as Development Scenario.

9.240 In terms of NSL, 254 (93%) of the 273 rooms assessed would meet the BRE criteria.

9.241 12 (4.5%) rooms will experience a **Minor Adverse** effect which is one less than recorded in Development Scenario.

Figure 9.5 Cumulative Assessment Proposed Development and Hotel Development



9.242 3 rooms (1%) will experience a moderate adverse effect and a further 4 rooms (1.5%) will experience a major adverse effect.

9.243 Overall, 6 properties (50%) highlighted grey within Table 9.7 below would not experience a noticeable alteration in the levels of daylight (VSC and NSL) they receive with the completed Proposed Development and Hotel Development in place. Therefore, it is considered that these properties would experience a **Negligible** effect, which is considered not significant.

9.244 The remaining 6 properties would experience alterations beyond the BRE guidance.

9.245 4 properties of the 6 properties do not experience any additional losses beyond those identified within Development Scenario and as such the comment has been provided above in relation to the completed

Development Scenario. These 4 properties are 61-62 St Marys Butts, 59-60 St Mary's Butts, 55-56 St Mary's Butts, 15 Queens Walk (Queens Court).

- 9.246** In comparison to Development Scenario, 1 additional window experiences a minor adverse impact this is located at Mcilroys Building and the alteration and 1 room changes from minor to moderate adverse alteration and is located at 58 St Marys Butts. Therefore overall in terms of significance criteria only one window and one room change from the Development Scenario. These properties are discussed below.

Mcilroys Building

- 9.247** A total of 197 windows serving 67 rooms were assessed for daylight within this mixed-use building for the Cumulative Assessment. In comparison to the results for Development Scenario, the daylight (VSC and NSL) results remain the same in terms of significance criteria aside from the VSC for one window which experiences a slight increase to the absolute change by 0.41 VSC and as a result retains a VSC of 26.85 VSC which is marginally short of the 27% BRE criteria. The window therefore technically falls below the BRE VSC criteria and experiences **Minor Adverse** alteration, however almost retains the recommendation.
- 9.248** For VSC, 91 (46%) of the windows assessed would meet the BRE criteria and are considered to experience a negligible effect.
- 9.249** The results in relation to NSL remain the same as that for Development Scenario and therefore comment has been provided above.
- 9.250** In consideration of the above and the retained daylight values, overall the effect to daylight within this residential property is considered to be **Minor** to **Moderate** adverse.

58 St Mary's Butts

- 9.251** A total of 4 windows serving 4 rooms were assessed for daylight within this mixed-use building.
- 9.252** For VSC, all windows (100%) meet the BRE criteria and are therefore considered to experience a negligible effect.
- 9.253** For NSL, all four rooms experience an alteration beyond the BRE criteria. 3 will experience alterations between 20%-29.99%, which is considered a minor adverse effect. These rooms retain a NSL of 51%-60% of the room area and retain VSC levels which adhere to the BRE Criteria. The slight increase in percentage loss when compared to Development Scenario is 1-2% NSL, in terms of absolute changes the difference is circa 1% NSL.
- 9.254** The remaining room will experience alterations of 33% which is considered a moderate adverse effect; the room retains a view of the sky to nearly half of the room area (47%) and the VSC value for the window serving the room is 29% which is more than the BRE recommendation of 27%. When compared to Development Scenario, the increase in loss for this room is c.4% in terms of percentage change and absolute NSL loss.
- 9.255** In consideration of the above, overall the effects to daylight amenity at this residential property is considered to be **Minor Adverse**.

Table 9.12 Cumulative Scenario Summary Table

Address	Total No. Windows	No. Windows that meet BRE criteria for VSC (≥27% VSC and/or ≤20% alteration)	%	Below BRE Guidelines			Total No. Windows below BRE Guidelines	%	Total No. Rooms	No. Rooms that meet BRE criteria for NSL (≤20% alteration)	%	Below BRE Guidelines			Total No. Rooms below BRE Guidelines	%
				>20 - <29.99% alteration	≥30 - <39.99% alteration	≥40% alteration						>20 - <29.99% alteration	≥30 - <39.99% alteration	≥40% alteration		
40-42 Oxford Road	12	12	100%	0	0	0	0	0%	6	6	100%	0	0	0	0	0%
38 Oxford Road	92	92	100%	0	0	0	0	0%	12	12	100%	0	0	0	0	0%
Mcilroys Building	197	92	46%	47	44	14	105	53%	67	60	90%	6	1	0	7	10%
61-62 St Mary's Butts	10	10	100%	0	0	0	0	0%	6	3	50%	2	1	0	3	50%
59-60 St Mary's Butts	6	6	100%	0	0	0	0	0%	6	2	33%	0	0	4	4	67%
58 St Mary's Butts	4	4	100%	0	0	0	0	0%	4	0	0%	3	1	0	4	100%
57 St Mary's Butts	2	2	100%	0	0	0	0	0%	2	2	100%	0	0	0	0	0%
55-56 St Mary's Butts	14	14	100%	0	0	0	0	0%	10	9	90%	1	0	0	1	10%
2-6 Castle Street	4	4	100%	0	0	0	0	0%	4	4	100%	0	0	0	0	0%
8 Castle Street	1	1	100%	0	0	0	0	0%	1	1	100%	0	0	0	0	0%
16 Castle Street	12	12	100%	0	0	0	0	0%	11	11	100%	0	0	0	0	0%
15 Queens Walk (Queens Court)	193	167	87%	26	0	0	26	13%	144	144	100%	0	0	0	0	0%
Totals	547	415	N/A	74	44	14	132	N/A	273	254	N/A	12	3	4	19	N/A
Totals (%)	N/A	76	N/A	14	8	3	24	N/A	N/A	93	N/A	4	1	1	7	N/A
*Properties highlighted in grey comply with both the VSC and NSL Daylight criterion and therefore will experience a negligible impact																

Sunlight

- 9.256 The full sunlight assessment is presented within ES Appendix DSO – Annex 3 (Volume 3).
- 9.257 A total of 424 windows have been assessed for sunlight within 9 neighbouring properties that are relevant for the sunlight assessment.
- 9.258 Of the 424 windows assessed, 345 (81%) would meet the BRE criteria for both winter and total sunlight (APSH).
- 9.259 In relation to winter sunlight, 382 (90%) meet the BRE criteria.
- 9.260 Of the 42 (10%) windows that do not meet the BRE criteria for Winter Sunlight, 2 experience a Minor Adverse effect, 3 experiences a Moderate Effect and 37 experiences a Major Adverse effect.
- 9.261 In relation to total sunlight (APSH) 372 (88%) meet the BRE criteria.

- 9.262 Of the 52 (12%) that do not meet the BRE criteria (APSH), 24 experience an alteration between 20-29% which is considered to be a Minor Adverse effect.
- 9.263 Of the remaining 28 windows (7%), 9 (2%) experience an alteration between 30- 40% which is considered to be a Moderate Adverse effect. 19 (4%) experience an alteration change above 40% which is considered to be a Major Adverse effect.
- 9.264 Overall, 5 properties will meet BRE Criteria for winter and annual sunlight.
- 9.265 None of the 4 that experience transgressions from the BRE guideline criteria will experience additional losses beyond those identified within the Development scenario in so far as the significance criteria for the windows and rooms remains the same. As such comment has been provided in relation to the occurrence and significance of the transgressions from the BRE Guidelines (APSH) above.

Table 9.13 Cumulative Scenario: Sunlight summary table

Address	Total No. Windows	No. Windows that meet Total & Winter BRE criteria for Sunlight (≥5% winter and/or ≤20% alteration AND ≥25% total and/or ≤20% alteration)	%	No. Windows that meet Winter BRE criteria for Sunlight (≥5% winter and/or ≤20% alteration)	%	Below BRE Guidelines for Winter Sunlight			Total no. Windows below BRE Guidelines for Winter Sunlight	%	No. Windows that meet Total BRE criteria for Sunlight (≥25% total and/or ≤20% alteration)	%	Below BRE Guidelines for Total Sunlight			Total no. Windows below BRE Guidelines for Total Sunlight	%
						>20 - <29.99% alteration	≥30 - <39.99% alteration	≥40 alteration					>20 - <29.99% alteration	≥30 - <39.99% alteration	≥40 alteration		
40-42 Oxford Road	12	12	100%	12	100%	0	0	0	0	0%	12	100%	0	0	0	0	0%
38 Oxford Road	74	43	58%	51	69%	0	3	20	23	31%	60	81%	9	3	2	14	19%
Mcilroys Building	197	161	82%	180	91%	0	0	17	17	9%	169	86%	10	6	12	28	14%
61-62 St Mary's Butts	10	8	80%	8	80%	2	0	0	2	20%	10	100%	0	0	0	0	0%
59-60 St Mary's Butts	6	6	100%	6	100%	0	0	0	0	0%	6	100%	0	0	0	0	0%
58 St Mary's Butts	4	4	100%	4	100%	0	0	0	0	0%	4	100%	0	0	0	0	0%
57 St Mary's Butts	2	2	100%	2	100%	0	0	0	0	0%	2	100%	0	0	0	0	0%
55-56 St Mary's Butts	14	14	100%	14	100%	0	0	0	0	0%	14	100%	0	0	0	0	0%
15 Queens Walk (Queens Court)	105	95	90%	105	100%	0	0	0	0	0%	95	90%	5	0	5	10	10%
Totals	424	345	N/A	382	N/A	2	3	37	42	N/A	372	N/A	24	9	19	52	N/A
Totals (%)	N/A	81%	N/A	90%	N/A	0%	1%	9%	10%	N/A	88%	N/A	6%	2%	4%	12%	N/A
*Properties highlighted in grey comply with both the Winter and Total Sunlight criterion and therefore will experience a negligible impact																	

Overshadowing

Sun Hours on Ground Assessment

9.266 As referred to above, the Sun Hours on Ground Assessment (SHOG) considered the Hotel Development Proposal in the proposed condition and therefore considered a worst case scenario which would capture any cumulative effect. Please refer to the SHOG assessment comment above.

Transient Overshadowing

9.267 The cumulative transient overshadowing study has been undertaken for 21st March, 21st June and 21st December. No additional increase in shadow coverage has been identified when compared to the results for the Development Scenario. As such the significance of effects remain the same as those in connection with the Development Scenario described above.

Hosier Street Area Development Framework

9.268 In general, it is considered that HSDAF massing would not create significant cumulative effects in relation to sensitive receptors near by the Proposed Development in terms of daylight, sunlight and overshadowing amenity. This is primarily due to the location of the HSADF Framework massing to the south west of the site which is away from the majority of residential neighbours, the tallest elements envisaged for the HSDAF are will also located away from existing residential buildings toward the A329 to the west.

9.269 In terms of Overshadowing, The Proposed Development was assessed (SHOG) to have a negligible effect upon 5 amenity areas and a **Minor Adverse** impact upon one, namely Amenity Area 6 as such there is not expected to be a significant cumulative overshadowing consideration. Amenity Area 3 may see some partial cumulative overshadowing although this is likely to be very limited due it's location to the south of the Proposed Development. Amenity Areas 3 and 4 are set to be redeveloped as part of the HSADF and so have been

scoped out of a cumulative consideration. Once more detailed massing is for the HSADF is confirmed it may be prudent to undertake a technical cumulative assessment.

Overall Conclusion

9.270 On the basis of the daylight, sunlight and overshadowing technical assessment the majority of properties assessed will experience negligible effects, with instances of minor, moderate and major adverse effects. It is considered that most meaningful development within an urban location will result in instances of moderate and major effects to sensitive neighbours and therefore may be unavoidable. Where transgressions of BRE guidance do occur in general the retained levels are considered to be close to the guideline criteria, considered commensurate with an urban location or as a result of low existing levels. Furthermore in several instances significant changes in light are considered to be mitigated by additional lighting sources to the particular room or losses are located to bedrooms which are considered to be less significant in terms daylight and sunlight.

9.271 Various design iterations were assessed during the design stages which were considered for daylight and sunlight and amendments made where possible to minimise the impact.

9.272 It is clear that the majority of properties assessed will not experience significant adverse effects.

9.273 Whilst there will be an instance of a minor adverse effect in terms of sun hours on ground (overshadowing) to Amenity Areas 6, the majority of external neighbouring amenity areas will not experience significant SHOG effects as a result of the Proposed Development. Furthermore, the transient overshadowing assessments indicate that additional overshadowing will be experienced during isolated periods of the day and thus these areas should remain unaffected for the majority of the day. As such, no mitigation is considered necessary.

9.274 The Cumulative Assessment identifies that nearly the entirety of all neighbouring sensitive receptors would see no significant cumulative impact. Only one window and one room experience marginally increased cumulative losses with regards to daylight to the extent the significance criteria increase from the Development Scenario however in both instances these represent marginal alterations in percentage change and absolute terms.

9.275 Overall, the Proposed Scheme including the Cumulative Assessment in GVA’s professional opinion is considered to be acceptable in consideration of the daylight, sunlight and overshadowing amenity to neighbouring sensitive receptors.

ANNEX 1

Table 9.14 Daylight significance summary table

Address	Development Scenario – Daylight Significance	Cumulative Assessment – Daylight Significance
40-42 Oxford Road	Negligible	Negligible
38 Oxford Road	Negligible	Negligible
Mcilroys Building	Minor to Moderate adverse	Minor to Moderate adverse
61-62 St Mary's Butts	Minor adverse	Minor adverse
59-60 St Mary's Butts	Moderate adverse	Moderate adverse
58 St Mary's Butts	Minor adverse	Minor adverse
57 St Mary's Butts	Negligible	Negligible
55-56 St Mary's Butts	Negligible	Negligible
2-6 Castle Street	Negligible	Negligible
8 Castle Street	Negligible	Negligible
16 Castle Street	Negligible	Negligible
15 Queens Walk (Queens Court)	Minor adverse	Minor adverse

Table 9.15 Sunlight significance summary table

Address	Development Scenario – Sunlight Significance	Cumulative Assessment – Sunlight Significance
40-42 Oxford Road	Negligible	Negligible
38 Oxford Road	Moderate adverse	Moderate adverse
Mcilroys Building	Minor adverse	Minor adverse
61-62 St Mary's Butts	Minor adverse	Minor adverse
59-60 St Mary's Butts	Negligible	Negligible
58 St Mary's Butts	Negligible	Negligible
57 St Mary's Butts	Negligible	Negligible
55-56 St Mary's Butts	Negligible	Negligible
15 Queens Walk (Queens Court)	Minor adverse	Minor adverse

Table 9.16 Overshadowing Sun Hours on Ground significance summary table

Overshadowing: Sun Hours on Ground (includes Development Proposal and Hotel Development)		
Amenity Area	Location	Significance
1	Public space - pedestrian shopping street - Oxford Road	Negligible
2	Public space - pedestrian shopping street - Queens Walk	Negligible
3	Queens Walk Public amenity space (adjacent to Queens Walk, the south of site)	Negligible
4&5	Public space - pedestrian shopping street - Hosier Street	Negligible
6	Public space - pedestrian shopping street - St Mary's Butts	Minor adverse

Table 9.17 Transient Overshadowing summary table

Transient Overshadowing			
Amenity Area	Location	Development Scenario: Significance	Cumulative Scenario: Significance
1	Public space - pedestrian shopping street - Oxford Road	Negligible	Negligible
2	Public space - pedestrian shopping street - Queens Walk	Negligible	Negligible
3	Queens Walk Public amenity space (adjacent to Queens Walk, the south of site)	Minor adverse	Minor adverse
4&5	Public space - pedestrian shopping street - Hosier Street	Minor adverse	Minor adverse
6	Public space - pedestrian shopping street - St Mary's Butts	Minor adverse	Minor adverse