Hawkins environmental

Daylight, Sunlight & Overshadowing Assessment:

90 Long Lane, Ickenham

Antech Solutions Ltd

9th May 2024

Report Details:

Report Title	Daylight, Sunlight & Overshadowing Assessment
Site	90 Long Lane, Ickenham
Client	Antech Solutions Ltd
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Version History:

Version	Date	Notes	Author	Checked
V1	9th May 2024	Original Issue	Nick Hawkins MSc MIEnvSc	Nick Hawkins MSc MIEnvSc

This report has been prepared by Hawkins Environmental Limited for the sole purpose of assisting in gaining planning consent for the proposed development described in the introduction of this report.

This report has been prepared by Hawkins Environmental Limited with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This assessment takes into account the prevailing conditions at the time of the report and assesses the impact of the development (if applicable) using data provided to Hawkins Environmental Limited by third parties. The report is designed to assist the developer in refining the designs for the proposed development and to demonstrate to agents of the Local Planning Authority that the proposed development is suited to its location. This should be viewed as a risk assessment and does not infer any guarantee that the site will remain suitable in future, nor that there will not be any complaints either from users of the development or from impacts emanating from the development site itself.

This report is for the exclusive use by the client named in the report. Hawkins Environmental Limited does not accept any liability in negligence for any matters arising outside of the agreed scope of works.

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1. INTRODUCTION

1.1. Overview

Hawkins Environmental Limited has been instructed by Antech Solutions Ltd to undertake a daylight, sunlight & overshadowing assessment for the proposed redevelopment of 90 Long Lane, situated in the Ickenham area of the London Borough of Uxbridge.

It has been identified that the site may require a daylight/sunlight assessment to determine whether the proposed development may affect the levels of daylight and sunlight falling on the windows of adjacent buildings, as well as gardens and outdoor amenity space.

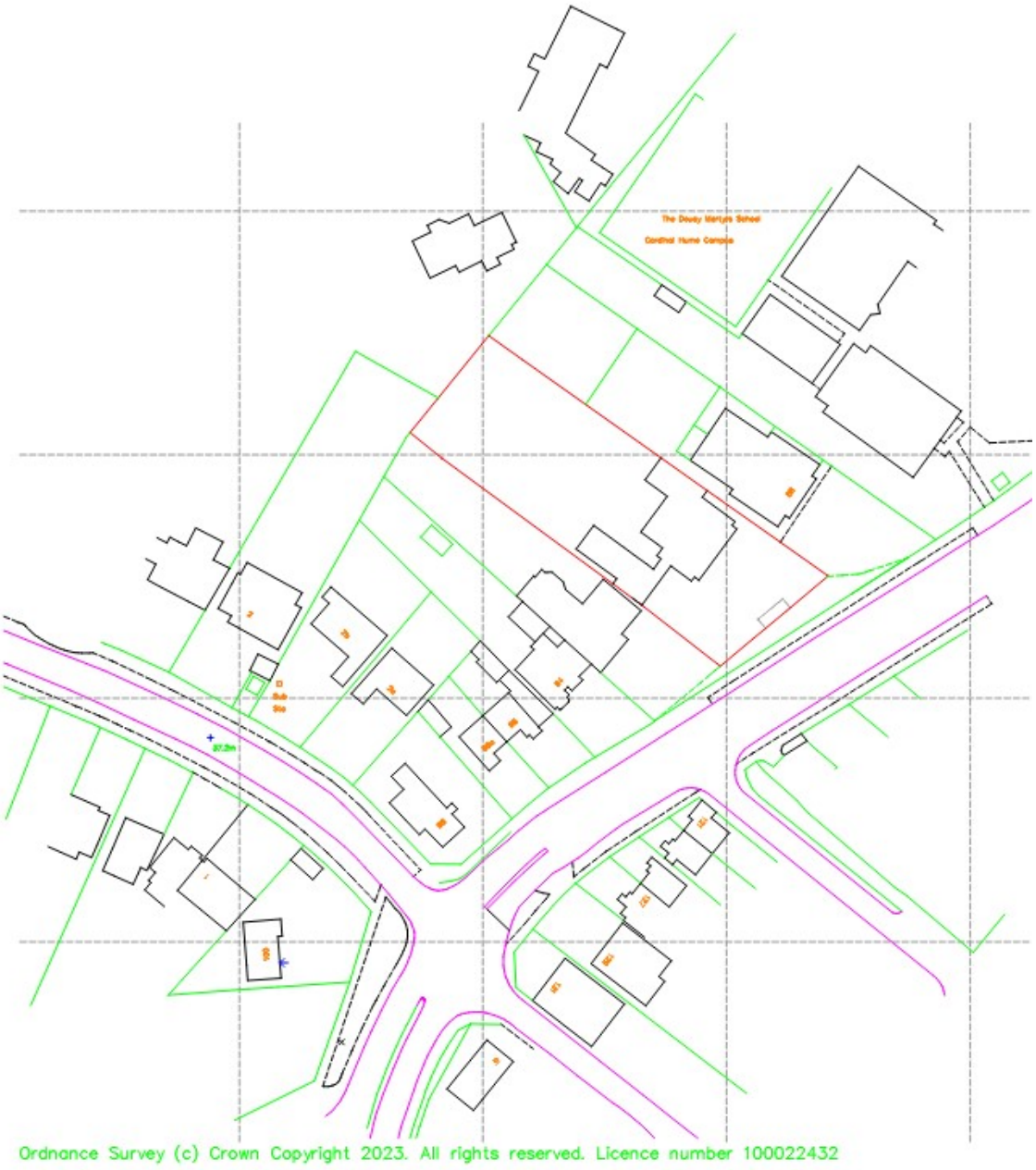
As a consequence, a daylight/sunlight assessment has been carried out in accordance with The Building Research Establishment (BRE) report, *"Site layout planning for daylight and sunlight – A guide to good practice"* by PJ Littlefair, S King, G Howlett, C Ticleanu and A Longfield (Third Edition – 2022). This report summarises an assessment of the impacts of the proposed development on the surrounding properties potential to receive daylight and sunlight. A glossary of terms in relation to daylight and sunlight can be found in **Appendix 1**.

This report should be read in conjunction with the "*H4090 - 90 Long Lane, Ickenham - Daylight Assessment Drawings v1"* which contained the drawings referred to in this report.

1.2. Site Description

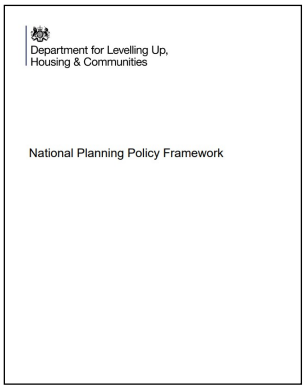
The application site is presently occupied by a single detached dwelling and is located on the north-west side of Long Lane, to the north of the Western Avenue (A40), towards the southern extremity of Ickenham. The site is located within a developed residential area comprising, in the main, fairly large detached and semi-detached dwellings. The site is separated from the Douay Martyrs School (Cardinal Hulme Campus) to the north, by a three-storey detached block comprising nine flats. The proposed development will see the demolition of the existing detached dwelling and the erection of a three-storey building to provide 9 no., 2-bedroom flats. A location plan of the proposed site can be seen in **Figure 1.1**.

Figure 1.1: Site Location Plan



2. NATIONAL & LOCAL PLANNING POLICY

2.1. National Planning Policy Framework (2023)



The National Planning Policy Framework (NPPF) was first published on the 27th March 2012 and revised July 2018, February 2019, July 2021 and September 2023, with the latest version published in December 2023 in response to the Levelling-up and Regeneration Bill.

The NPPF outlines the Government's planning policies for England and determines how they should be applied. It provides a framework within which Local Planning Authorities are required to prepare their own locally-prepared plans, where both the policies within the NPPF and the local plan are material planning considerations against which planning decisions are determined. These distinctive local and neighbourhood plans should be interpreted and applied in order to meet the needs and priorities of their communities.

The NPPF notes *"The purpose of the planning system is to contribute to the achievement of sustainable development, including the provision of homes, commercial development, and supporting infrastructure in a sustainable manner"* (Paragraph 7). The NPPF notes sustainable development should be delivered with three main dimensions: economic; social and environmental (Paragraph 8).

The NPPF supports a presumption in favour of development, unless the adverse impacts of that development outweighs the benefits it notes "*that sustainable development is pursued in a positive way, at the heart of the Framework is a presumption in favour of sustainable development*" (Paragraph 10).

The NPPF states that in the planning system *"Planning policies and decisions should contribute to and enhance the natural and local environment by… e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans"* (Paragraph 180).

Since the publication of the revised 2018 version of the NPPF (which has been retained in the 2019, 2021 and both 2023 versions), the NPPF talks specifically about daylight. Paragraph 129 states that:

"Where there is an existing or anticipated shortage of land for meeting identified housing needs, it is especially important that planning policies and decisions avoid homes being built at low densities, and ensure that developments make optimal use of the potential of each site. In these circumstances… local planning authorities should refuse applications which they consider fail to make efficient use of land, taking into account the policies in this Framework. In this context, when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site (as long as the resulting scheme would provide acceptable living standards)".

2.2. Planning Practice Guidance

The Planning Practice Guidance (PPG) was launched on 6th March 2014 and provides additional guidance and interpretation to the Government's strategic policies, outlined within the NPPF, in a web-based resource. This is updated regularly.

The PPG discusses the importance of good design and references daylight and sunlight on a number of occasions, specifically the need to ensure that daylight and sunlight patterns are considered when considering the form and scale of a new building, especially in relation to tall buildings.

In the guidance note "*Effective use of land*", last updated in 2019, guidance is provided on making effective use of land, including planning for higher density development.

The guidance states that *"a range of considerations should be taken into account in establishing appropriate densities on a site or in a particular area. Tools that can assist with this include… characterisation studies and design strategies, dealing with issues such as urban form, historic character, building typologies, prevailing sunlight and daylight levels, green infrastructure and amenity space; (Paragraph: 004 Reference ID: 66-004-20190722)".*

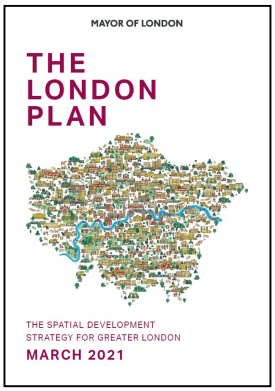
The guidance notes that daylight is a consideration: *"Where a planning application is submitted, local planning authorities will need to consider whether the proposed development would have an unreasonable impact on the daylight and sunlight levels enjoyed by neighbouring occupiers, as well as assessing whether daylight and sunlight within the development itself will provide satisfactory living conditions for future occupants (Paragraph: 006 Reference ID: 66-006-20190722)".*

It goes on to note that *"all developments should maintain acceptable living standards. What this means in practice, in relation to assessing appropriate levels of sunlight and daylight, will depend to some extent on the context for the development as well as its detailed design. For example in areas of high-density historic buildings, or city centre locations where tall modern buildings predominate, lower daylight and daylight and sunlight levels at some windows may be unavoidable if new developments are to be in keeping with the general form of their surroundings.*

In such situations good design (such as giving careful consideration to a building's massing and layout of habitable rooms) will be necessary to help make the best use of the site and maintain acceptable living standards (Paragraph: 007 Reference ID: 66-007-20190722)".

Therefore, whilst it is important to ensure that levels of internal daylight within dwellings are maximised, the numerical guidelines are flexible and may vary depending on the context of the site.

2.3. The London Plan (2021)



The New London Plan was formally published on the 2nd of March 2021 and replaces the previous London Plan.

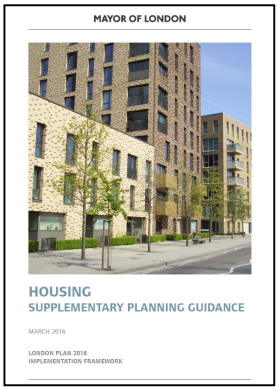
The New London Plan, provides substantial revisions in relation to daylighting. Policy D6 - Housing quality and standards states:

"D. The design of development should provide sufficient daylight and sunlight to new and surrounding housing that is appropriate for its context, whilst avoiding overheating, minimising overshadowing and maximising the usability of outside amenity space".

Policy D9 - Tall buildings states in relation to the environmental impact of tall structures that:

"Wind, daylight, sunlight penetration and temperature conditions around the building(s) and neighbourhood must be carefully considered and not compromise comfort and the enjoyment of open spaces, including water spaces, around the building".

2.4. Housing Supplementary Planning Guidance (2016)



Published in March 2016, the Housing Supplementary Planning Guidance highlights the elements of the London Plan that are relevant to housing development, and where applicable, provides more detail.

One important aspect of the Housing SPG is that it acknowledges that the BRE Guidelines should be applied flexibly. The SPG states:

"Policy 7.6Bd requires new development to avoid causing 'unacceptable harm' to the amenity of surrounding land and buildings, particularly in relation to privacy and overshadowing and where tall buildings are proposed. An appropriate degree of flexibility needs to be applied when using BRE guidelines to assess the daylight and sunlight impacts of new development on surrounding properties, as well as within new developments themselves. Guidelines should be applied sensitively to higher density development, especially in opportunity areas, town centres, large sites and accessible locations, where BRE advice suggests considering the use of alternative targets. This should take into account local circumstances; the need to optimise housing capacity; and scope for the character and form of an area to change over time.

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

The accompanying notes to Standard 32 reinforce this view and state that:

"BRE guidelines on assessing daylight and sunlight should be applied sensitively to higher density development in London, particularly in central and urban settings, recognising the London Plan's strategic approach to

optimise housing output (Policy 3.4) and the need to accommodate additional housing supply in locations with good accessibility suitable for higher density development (Policy 3.3). Quantitative standards on daylight and sunlight should not be applied rigidly, without carefully considering the location and context and standards experienced in broadly comparable housing typologies in London".

Standard 32 talks directly about the need for direct sunlight. The standard states:

"All homes should provide for direct sunlight to enter at least one habitable room for part of the day. Living areas and kitchen dining spaces should preferably receive direct sunlight".

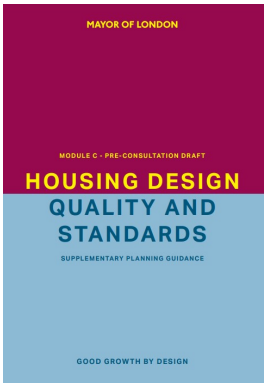
The accompanying notes go on to state that:

"Daylight enhances residents' enjoyment of an interior and reduces the energy needed to provide light for everyday activities, while controlled sunlight can help to meet part of the winter heating requirement. Sunlight is particularly desirable in living areas and kitchen dining spaces… (The) BRE good practice guidelines and methodology can be used to assess the levels of daylight and sunlight achieved within new developments…"

The guidance goes on to state that where Standard 32 cannot be achieved when it is not possible to provide direct sunlight to at least one habitable room:

"… developers should demonstrate how the daylight standards proposed within a scheme and individual units will achieve good amenity for residents. They should also demonstrate how the design has sought to optimise the amount of daylight and amenity available to residents, for example, through the design, colour and landscaping of surrounding buildings and spaces within a development".

2.5. Housing Design Quality and Standards Supplementary Planning Guidance (2020)



Published by the Mayor of London in 2020 as a draft, the Housing Design Quality and Standards SPG was originally intended to be a fully adopted SPG. However, the guidance was never adopted and was affectively replaced by the House Design Standards LPG. Whilst therefore not official policy, the document provides significant additional guidance on the interpretation of the 2016 Housing Supplementary Planning Guidance.

The Guidance notes *"Natural light can be restricted in densely developed areas. However, an appropriate degree of flexibility needs to be applied when using BRE guidelines to assess the daylight and sunlight impacts within proposed new homes, as well as the impact that proposed development would have on surrounding homes and open spaces".*

Specifically in relation to the impact of a development on surrounding properties, the guidance notes that *"Guidelines should be applied sensitively to higher density development, where BRE advice suggests considering the use of alternative targets. This should take into account local circumstances, the need to optimise housing capacity, and the scope for the character and form of an area to change over time".*

"The BRE guidelines apply nationwide, and the default numerical targets provided are purely advisory. These are based on a uniform, 25 degree development angle (vertical obstruction angle) typical of a low-rise suburban location. This corresponds to the Vertical Sky Component (VSC) target of 27 per cent cited in the guidelines. Typical development angles in a city or central urban location are considerably higher. In Central London,

development angles of 40 degree or 50 degree are common and can, if well planned, deliver successful schemes. A uniform development angle of 40 degree corresponds to a VSC target of 18 per cent, and 50 degree gives a VSC target of 13 per cent. Such daylight levels have been accepted in many desirable central areas for well over a century…".

"Even with access to good levels of daylight on the outside of a building, it is possible to have low levels of daylight within a building due to design features such as small windows, recessed windows, poor placement of balconies or deep rooms. Therefore, consideration of the retained target VSC should be the principal consideration. Where this is not met in accordance with BRE guidance, it should not be less than 0.8 times its former value (which protects areas that already have low daylight levels)".

"Less weight should be given to the room-based measures of daylight such as 'no-sky line' or average daylight factor as these are dependent on the design of the neighbouring property. Except in exceptional circumstances, design features of neighbouring properties (which the guidance notes could include small windows, recessed windows, poor placement of balconies or deep rooms) should not hamper the development potential of a site".

In relation to levels of daylight within a proposed development, the new guidance recognises for the first time that whilst the target ADF value for a kitchen is 2%, where the *"principal use of rooms designed as a 'living room/kitchen/dining room' is as a living room…, it would be reasonable to apply a target of 1.5 per cent".* Furthermore, the guidance acknowledges the competing requirements for daylight and usable outdoor amenity space and notes that the need for balconies *"can have significant bearing on the daylight and sunlight levels reaching nearby windows and rooms. Inevitably, any window or room under a balcony will receive much lower daylight and sunlight levels, although the adjacent balcony space will typically have excellent levels of daylight and sunlight amenity. Given this, the Mayor encourages boroughs to allow the daylight levels on the balcony to contribute to the ADF of the adjacent living space".*

3. ASSESSMENT METHODOLOGY & GUIDANCE

3.1. Site Layout Planning for Daylight and Sunlight - A Guide to Good Practice (2022)

3.1.1. Overview

The Building Research Establishment (BRE) report, "*Site layout planning for daylight and sunlight – A guide to good practice"* Third Edition 2022 by PJ Littlefair, S King, G Howlett, C Ticleanu and A Longfield (referred to as the BRE Guidance) is almost universally used as the official method in the UK and Ireland for determining whether a development meets good practice standards of daylight and sunlight and for determining the impact of a development on daylight and sunlight availability.

The BRE Guidance contains guidance on how to design developments, whilst minimising the impacts on existing buildings from overshadowing and reduced levels of daylight and sunlight, as well as solar dazzle from sloping buildings. In addition, the BRE Report provides advice on how to design buildings to ensure that they retain good practice levels of daylight and sunlight. As well as advice, the report contains a methodology to assess levels of daylight, sunlight and overshadowing and contains criteria to determine the potential impacts of a new development on surrounding buildings and to determine whether new developments are well lit internally. However, the report does state that the good practice guidelines are not mandatory, but should be considered as a guide to help rather than constrain the designer.

The BRE Report looks at three separate areas when considering the impacts on natural lighting:

1. **Daylight** – i.e. the impacts of diffuse daylight.
2. **Sunlight** – i.e. the impacts of only the direct sunlight; and
3. **Overshadowing** of Gardens and Open Spaces.

It is important to note that the methods contained within the BRE Guidance are not tests to determine whether a development meets the guidance, rather "*A Guide to Good Practice".* Therefore, whilst one should try to achieve the numerical guidance within the report, a transgression from the BRE Guidance does not indicate that the development is unsuitable, nor is it an indication that planning permission should be refused.

The assessment of daylight, sunlight and overshadowing considered several different areas, specifically:

1. The impact of the Proposed Development on levels of daylight reaching surrounding windows;
2. The impact of the Proposed Development on levels of sunlight reaching surrounding windows; and
3. The impact of the Proposed Development on sunlight and shadowing to surrounding gardens and outdoor amenity space.

The BRE Guidance provides a methodology for calculating the amount of daylight and sunlight falling on a window. The Vertical Sky Component (VSC) is used to describe the amount of daylight falling on a window, with the Annual Probable Sunlight Hours (APSH) used to describe the amount of sunlight falling on the window.

3.1.2. BRE Methodology for Determining Sensitive Receptors

The BRE Guidance suggests that the assessment of daylight is required for windows serving 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 assessed. The guidelines also apply to any room that may have a reasonable expectation of daylight, including schools and hospitals. Commercial properties and hotels are deemed to have a greater reliance on supplementary electric lighting and are therefore not included in this assessment. For the purposes of this assessment, only habitable rooms within residential properties surrounding the site have been assessed.

The BRE Guidance suggests that the assessment of sunlight is generally applied to all main living rooms and conservatories. Kitchens and bedrooms are less important, although care should be taken not to block too much sun.

Regarding overshadowing, the BRE Report suggests that the following open spaces should be checked:

- Gardens, usually the main back garden of a house;
- Parks and playing fields;
- Children's playgrounds;
- Outdoor swimming pools and paddling pools;
- Sitting out areas such as those between non-domestic buildings and in public squares; and
- Focal points for views such as a group of monuments or fountains.

3.1.3. BRE Daylight Criteria

To determine the impact on daylight to windows, diffuse daylight of an existing building may be affected by a proposed development if either:

- The Vertical Sky Component (VSC) measured at the centre of an existing main window is less than 27% and less than 0.8 times its former value; or
- The area of the working plane which can receive direct skylight is reduced to less than 0.8 times its former value.

It should be noted that determining the area of the working plane which can receive direct light from the sky (which is often referred to as the No-Sky Line or NSL) is seen as an additional assessment, rather than as an alternative to VSC. However, since plotting the NSL requires knowledge of the room geometry, which is not usually available during an impact assessment, it is not always possible to calculate the NSL since the use of too many assumptions would make the results meaningless and unreliable.

3.1.4. BRE Sunlight Criteria

To determine the impact on sunlight on windows, direct sunlight to existing windows may be affected by a Proposed Development if at the centre of a window:

- Receives less than 25% of Annual Probable Sunlight Hours (APSH) throughout the whole year, or less than 5% APSH between 21st September and 21st March;

- Receives less than 0.8 times its former APSH during either period; and
- Has a reduction in sunlight over the whole year of greater than 4% APSH.

It should be noted that loss of sunlight to windows only needs to be assessed if the window faces within 90° of due south.

The BRE Guidance is explicit that sunlight in living rooms is much more important than to bedrooms or kitchens. The guidance is clear that all window of habitable rooms facing within 90° of due south (regardless of use) should be assessed, as it is still important to ensure impacts to bedrooms and kitchens are minimised, but any impacts to these room uses would be less significant.

3.1.5. BRE Overshadowing Criteria

For a garden or outdoor amenity space to be considered well sunlit, at least 50% of the garden or amenity space must receive at least two hours of direct sunlight on the 21st March. If this cannot be achieved, providing that the area overshadowed with the Proposed Development in place would be greater than 0.8 times the existing level of shadowing, it is considered that no effect on overshadowing would occur.

3.1.6. BRE Significance Criteria

The BRE Guidance indicates that if the reduction in daylight or sunlight as a consequence of the impact of a development fails to meet the guidelines, the impact *could* be considered significant.

However, the BRE Guidance makes note that the guidance represents *"Best Practice Guidance"* and transgressions from the numerical guidelines within the Guidance does *not necessarily* mean that the development's impact would be significant or unacceptable. The BRE Report states: *"The advice given (in the report) is not mandatory and guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in layout design."*

It should be noted that the numerical targets set out in the main text of the BRE Guidelines have been derived from a low-density suburban housing model of well-spaced two-storey houses, hence the VSC target of 27%, which is equivalent to an obstruction of 25°. This is why reference is made to the circumstances for setting alternative numerical targets in Appendix F of the Guidelines where the nature of an area is dense or higher rise.

Whilst the thresholds contained within the Guidance are an important indicator when determining the impact magnitude and the significance of an impact, the BRE Guidance suggests that professional judgement should be used and the assessment of the impact should rely on a range of factors.

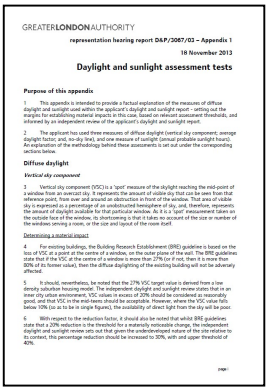
Whilst the threshold of noticeability has a numerical threshold, the method to describe the magnitude of the impact is less rigid and relies on judgement and the consideration of various factors. Appendix H of the BRE Guidance provides guidance on how this can be described. **Table 3.1** shows the impact descriptors on individual receptors.

Table 3.1: Impact Descriptor

Criteria	Impact Descriptor
Where the decrease in daylight or sunlight fails to meet the guidelines, and one or more of the following scenarios apply: • a large number of windows or a large area of open space is affected; • the loss of light is substantially outside the guidelines; • all windows in a particular property are affected; • the affected building or outdoor space has a particularly strong requirement for light, e.g. a living room in a dwelling or a children's playground.	Major Adverse
Where the decrease in daylight or sunlight fails to meet the guidelines, **and** one or more of the scenarios to describe a Minor Adverse Impact applies, **and** one or more of the scenarios to describe a Major Adverse Impact applies.	Moderate Adverse
Where the decrease in daylight or sunlight fails to meet the guidelines, and one or more of the following scenarios apply: • only a small number of windows or limited area of open space is affected; • the loss of light is only just outside the guidelines; • an affected room has other sources of light; • the affected building or outdoor space has a low-level requirement for light.	Minor Adverse
Where the increase/decrease in daylight or sunlight fully meets the guidelines and if there is an increase in daylight or sunlight, the increase is "tiny".	Negligible
Where the increase in daylight or sunlight is small and/or the number of affected windows or area of open space affected is small.	Minor Beneficial
Where the increase in daylight or sunlight is moderate and/or the number of affected windows or area of open space affected is moderate.	Moderate Beneficial
Where the increase in daylight or sunlight is large and/or the number of affected windows or area of open space affected is large.	Major Beneficial

Source: Adapted from Appendix H of the BRE Guidance

3.2. Representation Hearing Report D&P/3067/03 – Daylight & Sunlight Assessment Test (2013)


GREATER**LONDON**AUTHORITY

representation hearing report D&P/3067/03 – Appendix 1

18 November 2013

Daylight and sunlight assessment tests

Purpose of this appendix

1 This appendix is intended to provide a factual explanation of the measures of diffuse daylight and sunlight used within the applicant's daylight and sunlight report – setting out the margins for establishing material impacts in this case, based on relevant assessment thresholds, and informed by an independent review of the applicant's daylight and sunlight report.

2 The applicant has used three measures of diffuse daylight (vertical sky component, average daylight factor, and, no-sky line), and one measure of sunlight (annual probable sunlight hours). An explanation of the methodology behind these assessments is set out under the corresponding sections below.

Diffuse daylight

Vertical sky component

3 Vertical sky component (VSC) is a 'spot' measure of the skylight reaching the mid-point of a window from an overcast sky. It represents the amount of visible sky that can be seen from that reference point, from over and around an obstruction in front of the window. That area of visible sky is expressed as a percentage of an unobstructed hemisphere of sky, and, therefore, represents the amount of daylight available for that particular window. As it is a 'spot' measurement taken on the outside face of the window, its shortcoming is that it takes no account of the size or number of the windows serving a room, or the size and layout of the room itself.

Determining a material impact

4 For existing buildings, the Building Research Establishment (BRE) guideline is based on the loss of VSC at a point at the centre of a window, on the outer plane of the wall. The BRE guidelines state that if the VSC at the centre of a window is more than 27% (or if not, then it is more than 80% of its former value), then the diffuse daylighting of the existing building will not be adversely affected.

5 It should, nevertheless, be noted that the 27% VSC target value is derived from a low density suburban housing model. The independent daylight and sunlight review states that in an inner city urban environment, VSC values in excess of 20% should be considered as reasonably good, and that VSC in the mid-teens should be acceptable. However, where the VSC value falls below 10% (so as to be in single figures), the availability of direct light from the sky will be poor.

6 With respect to the reduction factor, it should also be noted that whilst BRE guidelines state that a 20% reduction is the threshold for a materially noticeable change, the independent daylight and sunlight review sets out that given the underdeveloped nature of the site relative to its context, this percentage reduction should be increased to 30%, with and upper threshold of 40%.

page 1

The BRE Guidance notes that the VSC at the centre of a window should be at least 27%; however, this target was derived from a low density housing model. It has been often stated that this should not therefore be applied equally in all situations. In connection with the development of Holy Trinity Primary School, Dalston in 2013 (planning application 2013/0457 to the London Borough of Hackney), the Greater London Authority conducted an independent review of daylight and sunlight methodologies (Greater London Authority - Representation Hearing Report D&P/3067/03 - Daylight and Sunlight Assessment Tests).

The Hearing Report stated that *"the independent daylight and sunlight review states that in an inner city urban environment, VSC values in excess of 20% should be considered as reasonably good, and that VSC in the mid-teens should be acceptable. However, where the VSC value falls below 10% (so as to be in single figures), the availability of direct light from the sky will be poor"*.

The Hearing Report also notes that flexibility can be applied to determining to determining the impact. In underdeveloped sites, 0.7 times or more the existing VSC may be a more appropriate criterion.

4. ASSESSMENT OF IMPACTS

This section summarises the impact of the proposed development on levels of daylight and sunlight on surrounding windows, as well as the overshadowing of gardens and outdoor amenity space.

4.1. Identification of Receptors

Based on the plans of the development, a number of windows that could be affected have been identified. The properties of interest can be seen in the site plan in **Figure 1.1**.

The main properties of interest are:

- 88 Long Lane; and
- 92 Long Lane.

4.2. Computer Model

For the purposes of the assessment, a three-dimensional computer model was constructed both with and without the proposed development in place. At this site, Hawkins Environmental were provided with planning drawings of both the proposed and existing site layout, including elevations, plans and sections, in order to model the existing and proposed site layouts.

In addition, information collected from the Local Planning Authority's planning archive have also been used, in the construction of the three-dimensional model. Ordnance Survey information (including Lidar data in relation to building heights) has also been used to construct the three-dimensional computer model.

Wherever possible, survey information has been utilised to add information to the model; however, where details were not present in the survey information, professional judgement has been used to estimate information where necessary.

Drawing No. **H4090_1** to **H4090_10** (found in the supporting document "*H4090 - 90 Long Lane, Ickenham - Daylight Assessment Drawings v1"*) which summarises the daylight/sunlight model, including views of the model from multiple directions, both with and without the proposed development, as well as diagrams showing the locations of the windows under consideration in Drawing No. **H4090_11 to H4090_13**.

4.3. Daylight Assessment to Windows

4.3.1. Vertical Sky Component

Based on the plans of the site and the positions of the closest buildings, it is possible to calculate the vertical sky component for the residential buildings, for both with and without the proposed development using a Waldram Diagram.

The methodology for calculating the VSC using the Waldram Diagrams is detailed within Appendix B of the Building Research Establishment (BRE) report, "*Site layout planning for daylight and sunlight – A guide to good practice"* Third Edition 2022 by PJ Littlefair, S King, G Howlett, C Ticleanu and A Longfield.

The Waldram Diagram dates back to 1923 and consists of a grid of squares, each representing an equal portion of available daylight. Upon the grid, it is possible to draw projections of obstructions as seen from a

reference point, plotted with reference to the azimuth angles and altitude angles measured from a reference point. The area of the diagram un-obscured equates to the VSC. If the Waldram Diagram is totally un-obscured by obstructions, this represents the maximum possible VSC of 39.6%. The diagram has been designed in such a way that vertical edges remain vertical in projection, but horizontal edges follow the so-called "droop" lines in order to take the cosine law of illumination and the non-uniform luminance of the sky into account. The Waldram Diagram method is a more complex method than the skylight indicator method also described in the BRE report. However, it tends to be more accurate and less open to interpretation and error.

Sample Waldram Diagrams can be seen in Drawing No. **H4090_14**. **Appendix 2** summarises the results of the daylight assessment.

The results show that of the 34 windows assessed, 4 of the windows do not fully achieve the guidance contained within the BRE Report, as they will receive a level of daylight with the proposed development of less than 27% VSC and the proposed level of daylight would be less than 0.8 times the existing level; therefore, the reduction in daylight may be noticeable.

However, where windows do not fully meet the BRE Guidance, it does *not necessarily* mean that the development's impact would be significant or unacceptable. The BRE Guidance represents *"Best Practice Guidance"* and it notes that the advice given in the report is not mandatory nor adopted planning policy and the numerical guidelines "*should be interpreted flexibly since natural lighting is only one of many factors in layout design".*

For example, it is necessary to have regard to whether or not the affected rooms are dual aspect; whether the windows serve habitable rooms and whether the windows are located close to the boundary of the site. It is also important that the scale of a development is allowed to be consistent with the existing environment and therefore, the results of a daylight assessment should reflect this. The BRE Guidance notes as an example, that in a mews in a historic city centre, a typical obstruction angle may be higher and therefore, a target value VSC of 18% may be more appropriate. This is an approach reinforced by the London Plan's Housing Supplementary Planning Guidance acknowledging that "*Quantitative standards on daylight and sunlight should not be applied rigidly, without carefully considering the location and context and standards experienced in broadly comparable housing typologies in London".*

Consequently, any window that does not fully achieve the guidance contained within the BRE Report has been considered individually to assess their likely significance:

- Window 22 serves the living room / kitchen of Flat G at 88 Long Lane. The proposed development will reduce the proposed VSC to this window marginally below 27% and the proposed level of daylight would be 0.71 times the former. However, Window 22 is a secondary window with Windows 19, 20 and 21 all also serving the same room, two of which will retain a VSC of over 27% and all three with a reduction in daylight that would be considered acceptable. Given this is a secondary window without further impacts to the other windows, it can be concluded that the room will remain well lit regardless to the impact to this window and therefore any impact to this rooms is considered insignificant.
- Windows 28 and 29 serve the living room / kitchen of Flat C at 88 Long Lane. As with the living room / kitchen of Flat G, windows 28 and 29 are secondary windows, with the primary window located at Window 27 which will retain over 36% VSC and will be significantly larger than both window 28 and 29

combined. Consequently, it can be concluded that the room will remain well lit despite the impact to these two windows and therefore any impact to this rooms is considered insignificant.

- Window 30 serves a bedroom to Flat A at 88 Long Lane. This bedroom is also served by window 34 where the impact is considered acceptable. Consequently, it can be concluded that the room will remain well lit despite the impact to this window and therefore any impact to this rooms is considered insignificant.

Consequently, it can be concluded that all impacts in relation to daylight can be considered insignificant.

4.3.2. No Sky Line

The working plane is a notional surface, typically at about desk or table height, at which the daylight factor or the 'no-sky line' is calculated or plotted. For the calculations required here, it is set at 0.85 m above the floor.

The no-sky line divides those areas of the working plane which can receive direct skylight, from those which cannot. It is important as it indicates how well daylight is distributed in a room. Areas beyond the no-sky line will generally look gloomy. The BRE documents suggests that following the construction of a new development, if the position of the no-sky line moves so that the area of the room which does not receive direct light from the sky is reduce to less than 0.8 times the existing area, this may result in a noticeable reduction in daylight to the occupants of the building and more of the room will appear noticeably gloomy. The guidance does go on to say that this approach does need to be applied flexibly and sensibly. It goes on to note that when assessing the impact to larger rooms, for example more than 5m deep, if they are only lit from one side, a greater movement of the no-sky line may be unavoidable.

It should be noted that determining the area of the working plane which can receive direct light from the sky (which is often referred to as the No-Sky Line or NSL) is seen as an additional assessment, rather than as an alternative to VSC. However, since plotting the NSL requires knowledge of the room geometry, which is not usually available during an impact assessment, it is not always possible to calculate the NSL since the use of too many assumptions would make the results meaningless and unreliable.

Based on the plans of the site, the positions of the closest buildings and the obtained floor plans and elevations of surrounding buildings, it has been possible to estimate the position of the NSL, for both with and without the proposed development for a number of rooms where floor plans and room dimensions were available.

The results of these calculations can be found in **Appendix 2**. Plans showing the existing, proposed and NSL ratio can be seen in Drawing No. **H4090_39** to **H4090_44.** On the existing and proposed NSL diagrams, the areas shaded yellow are most well lit, with the areas in blue the least well lit; the areas marked in black are the areas without a direct view of the sky, i.e. beyond the NSL. In the ratio diagrams, areas marked in blue see no change in NSL position as a consequence of the proposed development, with areas losing a direct view of the sky as a consequence of the proposed development are noted in red.

The results show that at all of the rooms assessed, whilst there is a reduction in the amount of the working place that receives direct light from the sky, the proposed area of the working plane that receives direct light from the sky would be greater than 0.8 times the existing area in all rooms. Therefore, any reduction in daylight is not considered significant.

4.4. Sunlight Assessment to Windows

In order to assess the impact of a development on the levels of sunlight, the APSH has been calculated for those windows which face within 90° of due south and hence fall within the BRE Sunlight criteria.

According to the BRE Report, direct sunlight on an existing window may be affected by a proposed development if the centre of a window receives less than 25% of Annual Probable Sunlight Hours (APSH), or less than 5% APSH between 21st September and 21st March; **and** receives less lean 0.8 times its former APSH during either period; **and** has a reduction in sunlight over the whole year of greater than 4% APSH.

Appendix 2 details the results of the Annual Probable Sunlight Hours (APSH) calculations for the windows under consideration, with sample Sunlight Indicator Diagrams replicated in Drawing No. **H4090_15**.

It can be seen from the results in **Appendix 2** that of the 14 windows assessed in relation to sunlight, 2 do not fully meet the recommendations contained within the BRE Guidance in relation to sunlight. However, these 2 windows (windows 28 and 29) are 2 of the same windows where the impact could be considered acceptable in relation to daylight given the context of the site and the guidance. As a consequence, the impact to these windows are not seen as significant.

4.5. Overshadowing Assessment to Gardens and Amenity Spaces

This section summarises the overshadowing impacts of the proposed development on gardens and outdoor amenity space. In order to assess the effects of overshadowing on gardens and outdoor amenity space, a three-dimensional model of the development and surrounding buildings has been constructed and the shadows caused by the building on the 21st of March has been assessed. The 21st of March is utilised because the day and night-time periods are of equal length. Furthermore, the 21st of March has been chosen as it is the Spring Equinox and is considered to be the first day of the year when the ability to enjoy one's garden or amenity space is important. Drawing No. **H4090_16** to **H4090_35** shows the results of the overshadowing assessment on the 21st of March for the existing and proposed site layout.

The Third Edition of the BRE Report, published in 2022, requires at least 50% of the garden should be capable of receiving at least two full hours of direct sunlight on the 21st of March. If this cannot be achieved, providing that the area overshadowed was greater than 0.8 times its former value, no impact would have occurred.

Drawing No. **H4090_36** shows the extent of overshadowing to outdoor amenity space with the existing site layout and Drawing No. **H4090_37** shows the extent of overshadowing to outdoor amenity space with the proposed site layout. The areas marked in yellow receive direct sunlight for at least two hours on the 21st March. Drawing No. **H4090_38** shows the areas where additional shading has occurred. On **H4090_38** the areas marked in red are the areas where additional shading has occurred. **Appendix 2** shows the results of the analysis. The analysis shows that on the 21st of March, whilst there is a small reduction in the amount outdoor amenity space that receives direct sunlight, over at least half of the area will continue to receive direct sunlight and therefore, any impact upon this amenity space is considered to be insignificant.

5. CONCLUSIONS

A daylight/sunlight assessment has been carried out in accordance with The Building Research Establishment (BRE) report*, "Site layout planning for daylight and sunlight – A guide to good practice"* by PJ Littlefair, S King, G Howlett, C Ticleanu and A Longfield (Third Edition – 2022), which summarises the impacts of the proposed development at 90 Long Lane, Ickenham on the surrounding properties potential to receive daylight and sunlight.

The results of the assessment demonstrate that under the guidance contained within Appendix H of the BRE Report, it is considered that the proposed development will have an insignificant impact to surrounding dwellings.

Appendix 1
Glossary of Lighting Terms

Appendix 1: Glossary of Daylighting Terms

From the BRE Guidance (2022)

Illuminance	A measure of the amount of light falling on a surface, usually measured in lux.
Target illuminance (E_T)	Illuminance from daylight that should be achieved for at least half of annual daylight hours across a specified fraction of the reference plane in a daylit space.
Minimum target illuminance (E_{TM})	Illuminance from daylight that should be achieved for at least half of annual daylight hours across 95% of the reference plane in spaces with vertical and/or inclined daylight apertures.
Daylight factor (D)	Ratio of total daylight illuminance at a reference point on the working plane within a space to outdoor illuminance on a horizontal plane due to an unobstructed CIE standard overcast sky. Thus a 1% D would mean that the indoor illuminance at that point in the space would be one hundredth the outdoor unobstructed horizontal illuminance.
Target daylight factor	Daylight factor value equivalent to the target illuminance to be exceeded for more than half of annual daylight hours over a specified fraction of the reference plane within a daylit space.
Minimum target daylight factor	Daylight factor value equivalent to the minimum target illuminance to be exceeded for more than half of annual daylight hours over 95% of the reference plane within spaces with vertical and/or inclined daylight apertures.
CIE standard overcast sky	A completely overcast sky for which the ratio of its luminance $L\gamma$ at an angle of elevation γ above the horizontal to the luminance Lz at the zenith is given by: $L\gamma = Lz \frac{(1 + 2 \sin \gamma)}{3}$ A CIE standard overcast sky is darkest at the horizon and brightest at the zenith (vertically overhead).
Daylight, natural light	Combined skylight and sunlight.
No sky line	The outline on the working plane of the area from which no sky can be seen.
Obstruction angle	The angular altitude of the top of an obstruction above the horizontal, measured from a reference point in a vertical plane in a section perpendicular to the vertical plane.
Annual probable sunlight hours	The long-term average of the total number of hours during a year in which direct sunlight reaches the unobstructed ground (when clouds are taken into account).
Sky factor	This is used in rights to light calculations. It is the ratio of the parts of illuminance at a point on a given plane that would be received directly through unglazed openings from a sky of uniform luminance, to the illuminance on a horizontal plane due to an unobstructed hemisphere of this sky. The sky factor does not include reflected light, either from outdoor or indoor surfaces.
Vertical sky component (VSC)	This is a measure of the amount of light reaching a window. It is 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 illuminance on a horizontal plane due to an unobstructed hemisphere of this sky. Usually the 'given vertical plane' is the outside of a window wall. The VSC does not include reflected light, either from the ground or from other buildings.
Reference plane or working plane	Horizontal, vertical, or inclined plane in which a visual task lies. Normally the working plane may be taken to be horizontal, 0.85 m above the floor in houses and factories, 0.7 m above the floor in offices.
Assessment grid	Grid of calculation points on the reference plane that is used to calculate daylight factor or illuminance from daylight. Also known as calculation grid.
(Solar) irradiance	A measure of the amount of solar radiation (including infrared and ultraviolet radiation as well as daylight) falling on a surface. Usually measured in Watts per square metre.

Appendix 2
Results of the BRE Analysis

Daylight Impact Assessment Results - VSC

Window Ref	Window ID	Vertical Sky Component %			Meets BRE Guide?	Window Orientation
		Existing	Proposed	Ratio*		
92 Long Lane - First Floor - W1	1	38.04	37.08	0.97	YES	310°N
92 Long Lane - First Floor - W2	2	34.28	33.72	0.98	YES	310°N
92 Long Lane - Ground Floor - W1	3	30.93	31.72	1.03	YES	310°N
92 Long Lane - Ground Floor - W2	4	25.19	25.15	1.00	YES	310°N
92 Long Lane - Ground Floor - W3	5	24.56	22.49	0.92	YES	40°N
92 Long Lane - Ground Floor - W4	6	26.60	24.34	0.92	YES	40°N
92 Long Lane - Ground Floor - W5	7	30.22	27.79	0.92	YES	40°N
92 Long Lane - Ground Floor - W6	8	30.35	27.84	0.92	YES	40°N
92 Long Lane - Ground Floor - W7	9	25.66	23.01	0.90	YES	82°N
92 Long Lane - Ground Floor - W8	10	35.39	32.34	0.91	YES	40°N
92 Long Lane - Ground Floor - W9	11	37.52	36.38	0.97	YES	358°N
92 Long Lane - Ground Floor - W10	12	35.30	32.83	0.93	YES	40°N
92 Long Lane - Ground Floor - W11	13	37.80	37.80	1.00	YES	310°N

Window Ref	Window ID	Vertical Sky Component %			Meets BRE Guide?	Window Orientation
		Existing	Proposed	Ratio*		
92 Long Lane - Ground Floor - W12	14	73.39	71.58	0.98	YES	82°N Inc
92 Long Lane - Ground Floor - W13	15	73.23	70.77	0.97	YES	40°N Inc
92 Long Lane - Ground Floor - W14	16	89.41	88.51	0.99	YES	358°N Inc
92 Long Lane - Ground Floor - W15	17	87.97	87.78	1.00	YES	312°N Inc
92 Long Lane - Ground Floor - W16	18	73.44	72.66	0.99	YES	132° Inc
Flat G 88 Long Lane - First Floor - W1	19	15.77	15.77	1.00	YES	304°N
Flat G 88 Long Lane - First Floor - W2	20	37.59	28.55	0.76	YES	214°
Flat G 88 Long Lane - First Floor - W3	21	36.84	27.01	0.73	YES	214°
Flat G 88 Long Lane - First Floor - W4	22	35.89	25.57	0.71	NO	214°
Flat E 88 Long Lane - First Floor - W5	23	37.11	28.39	0.77	YES	214°
Flat E 88 Long Lane - First Floor - W6	24	37.67	32.03	0.85	YES	214°
Flat E 88 Long Lane - First Floor - W7	25	37.73	33.67	0.89	YES	214°
Flat E 88 Long Lane - First Floor - W8	26	39.22	39.22	1.00	YES	124°
Flat C 88 Long Lane - Ground Floor - W1	27	37.12	36.10	0.97	YES	304°N

Window Ref	Window ID	Vertical Sky Component %			Meets BRE Guide?	Window Orientation
		Existing	Proposed	Ratio*		
Flat C 88 Long Lane - Ground Floor - W2	28	22.37	16.46	0.74	NO	214°
Flat C 88 Long Lane - Ground Floor - W3	29	23.02	15.65	0.68	NO	214°
Flat A 88 Long Lane - Ground Floor - W4	30	23.41	18.22	0.78	NO	214°
Flat A 88 Long Lane - Ground Floor - W5	31	27.61	23.62	0.86	YES	214°
Flat A 88 Long Lane - Ground Floor - W6	32	30.00	26.65	0.89	YES	214°
Flat A 88 Long Lane - Ground Floor - W7	33	36.89	36.89	1.00	YES	124°
Flat A 88 Long Lane - Ground Floor - W8	34	16.71	14.01	0.84	YES	304°N

*= Ratio of proposed levels compared to existing levels

Daylight Impact Assessment Results - NSL

Address	Room Use	Amount of the working plane that receives direct light from the sky % (the NSL)			Meets BRE Guide?
		Existing	Proposed	Ratio*	
92 Long Lane - First Floor - R1	Bedroom	100%	100%	1.00	YES
92 Long Lane - First Floor - R2	Bedroom	100%	100%	1.00	YES
92 Long Lane - Ground Floor - R1	Living Room	100%	100%	1.00	YES
92 Long Lane - Ground Floor - R2	Living Room	100%	89%	0.89	YES
92 Long Lane - Ground Floor - R3	Living Room	100%	100%	1.00	YES
Flat A 88 Long Lane - Ground Floor - R1	Bedroom	100%	88%	0.88	YES
Flat A 88 Long Lane - Ground Floor - R2	Living Room / Kitchen	100%	100%	1.00	YES
Flat C 88 Long Lane - Ground Floor - R2	Living Room / Kitchen	100%	100%	1.00	YES
Flat E 88 Long Lane - First Floor - R1	Bedroom	100%	100%	1.00	YES

*= Ratio of proposed levels compared to existing levels

Sunlight Impact Assessment Results

Window Ref	ID	Annual Probable Sunlight Hours %				Winter Probable Sunlight Hours %			
		Existing	Proposed	Ratio*	Meets BRE Guide?	Existing	Proposed	Ratio*	Meets BRE Guide?
92 Long Lane - Ground Floor - W16	18	49	48	0.98	YES	1	1	1.00	YES
Flat G 88 Long Lane - First Floor - W2	20	77	64	0.83	YES	27	14	0.52	YES
Flat G 88 Long Lane - First Floor - W3	21	77	63	0.82	YES	27	14	0.52	YES
Flat G 88 Long Lane - First Floor - W4	22	73	59	0.81	YES	23	11	0.48	YES
Flat E 88 Long Lane - First Floor - W5	23	75	63	0.84	YES	25	21	0.84	YES
Flat E 88 Long Lane - First Floor - W6	24	75	66	0.88	YES	25	23	0.92	YES
Flat E 88 Long Lane - First Floor - W7	25	76	69	0.91	YES	27	24	0.89	YES
Flat E 88 Long Lane - First Floor - W8	26	68	68	1.00	YES	23	23	1.00	YES
Flat C 88 Long Lane - Ground Floor - W2	28	53	38	0.72	YES	6	3	0.5	NO
Flat C 88 Long Lane - Ground Floor - W3	29	50	33	0.66	YES	5	3	0.6	NO
Flat A 88 Long Lane - Ground Floor - W4	30	53	40	0.75	YES	15	15	1.00	YES
Flat A 88 Long Lane - Ground Floor - W5	31	60	49	0.82	YES	21	19	0.9	YES

Window Ref	ID	Annual Probable Sunlight Hours %				Winter Probable Sunlight Hours %			
		Existing	Proposed	Ratio*	Meets BRE Guide?	Existing	Proposed	Ratio*	Meets BRE Guide?
Flat A 88 Long Lane - Ground Floor - W6	32	62	57	0.92	YES	22	22	1.00	YES
Flat A 88 Long Lane - Ground Floor - W7	33	67	67	1.00	YES	23	23	1.00	YES

*= Ratio of proposed levels compared to existing levels

Overshadowing Impact Assessment Results

	Percentage of the Garden/Outdoor Amenity Space Which Receives Direct Sunlight for at Least Two Hours on the 21st March			
Receptor	Existing	Proposed	Ratio*	Meets BRE Guide?
88 Long Lane	90%	89%	0.99	YES
92 Long Lane	86%	86%	1.00	YES

*= Ratio of proposed levels compared to existing levels