



OXFORD CITY COUNCIL

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## OCC SANDY LANE - DSO

Daylight, Sunlight and Overshadowing Assessment





**OXFORD CITY COUNCIL**

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**PROJECT NO. 70062891**

**OUR REF. NO. 021**

**DATE: DECEMBER 2021**

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OXFORD CITY COUNCIL

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Daylight, Sunlight and Overshadowing Assessment

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Date	15 Oct 2021	12 Nov 2021	16 Dec 2021	
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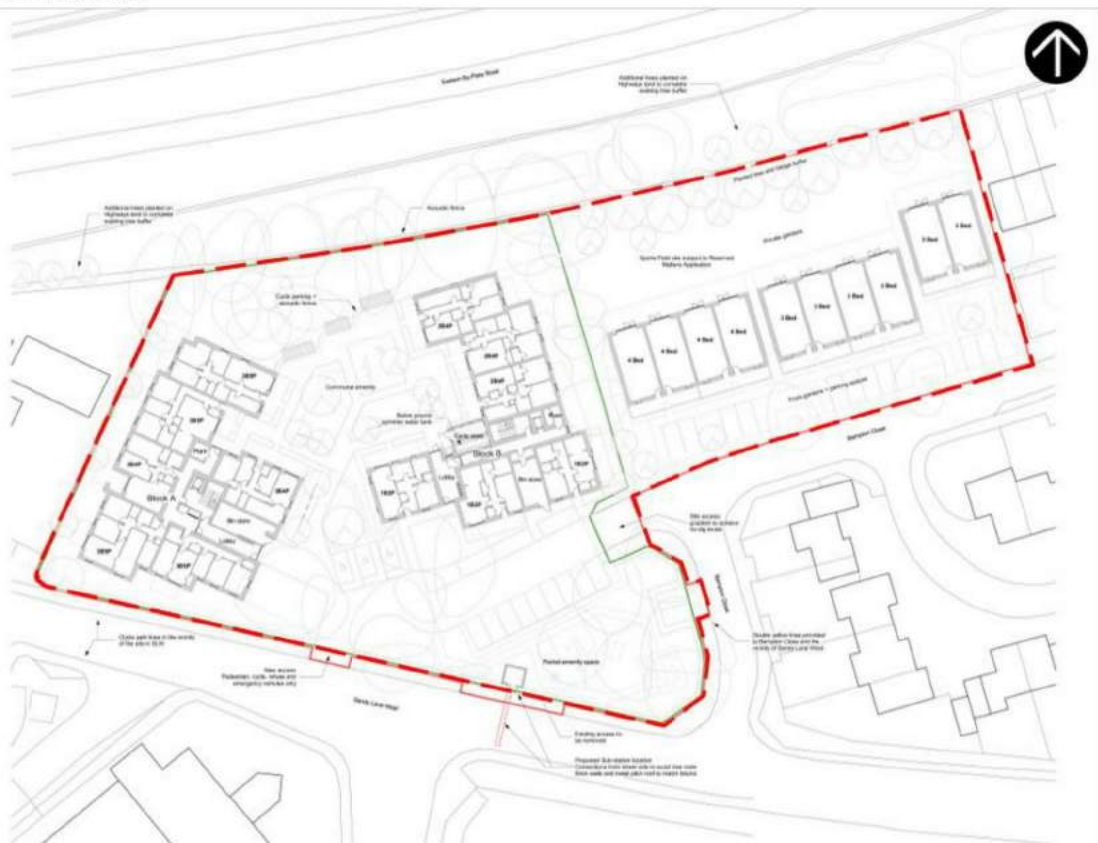
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# 1. INTRODUCTION

- 1.1.1. WSP has been appointed by Oxford City Council to provide a Daylight and Sunlight Assessment of the Proposed Development in the site located in Oxford. The assessment which is provided to accompany the planning application, comprises the quantification of the daylight and sunlight within the proposed dwellings and the Impact Assessment on the daylight and sunlight of the residential buildings surrounding the Site.
- 1.1.2. The Site is located in Littlemore, Oxford and is bounded by Sandy Ln W, and Bampton close to the south and Eastern By-Pass Rd to the north. The south-west boundaries of the Site comprise mostly mixed-use commercial properties, and residential units on the south-east to the east. Currently the Site consists of Northfield Hostel and a sport field, which has not been used for 3 years.
- 1.1.3. The Proposed Development is planned to create 61 new homes, with 83% being provided as social rent and other affordable tenures. The remaining 10 homes will be offered for private sale. The proposed development consists of a total 2 main blocks (Block A, Block B) comprising of 4 floors of 1-3 bedroom flats. The east part of the development has 2 blocks of 3-4 bedroom houses.
- 1.1.4. The Site is highlighted by the redline boundary shown in Figure 1-1 below.

**Figure 1-1– Site Plan**



## 2. PLANNING POLICY AND GUIDANCE

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### 2.1. POLICY CONTEXT

#### LEGISLATIVE FRAMEWORK

- 2.1.1. There is no applicable legislation of relevance to this assessment.

#### NATIONAL PLANNING POLICY FRAMEWORK

- 2.1.2. National Planning Policy Framework (Ref.1) refers to daylight, sunlight and overshadowing in para 125 (c) of section 11. Making Effective Use of Land:

*“125. 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:*

*(c) 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).”*

- 2.1.3. Most Local Authorities in the UK recognise the guidelines set out in the BRE Guide Site Layout Planning for Daylight and Sunlight, A Guide to Good Practice (Ref.2) as the most appropriate method for daylight, sunlight and overshadowing assessments.

#### GUIDANCE

##### Site Layout Planning for Daylight and Sunlight, a Guide to Good Practice

- 2.1.4. The BRE Guide: Site Layout Planning for Daylight and Sunlight, A Guide to Good Practice (Ref. 2) is recognised as the most appropriate method for daylight, sunlight and overshadowing assessments. These guidelines were first published in 1991 and superseded the 1971 Department of the Environment Document Sunlight and Daylight. The latest edition was published in 2011.
- 2.1.5. Whilst the BRE Guide provides numerical guidelines for daylight, sunlight and overshadowing, the Guide is not an instrument of planning policy, therefore some level of flexibility should be applied where appropriate.
- 2.1.6. The BRE document also includes advice for interior daylight although the recommendations contained within the guide are referred from the BS 8206-2 Code of practice for daylighting (Ref 3), and from the CIBSE publication Daylighting and window design (Ref 4) which give guidance on the design of buildings for good interior daylighting. The advice given in the BRE Guide is intended to be used in conjunction with these two documents as these focus on interior daylighting while the BRE Guide complements them by providing advice on the impacts on the external environment.

### 3. METHODOLOGY & CRITERIA

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- 3.1.1. The assessment has been carried out to verify the level of adherence to the recommended BRE Criteria: Daylight and Sunlight Assessment within the Proposed Development as well as Daylight and Sunlight Impact of the Proposed Development on the existing adjacent properties. The BRE Guide gives criteria and methods for calculating daylight and sunlight both within new developments and the impact on existing surrounding windows.
- 3.1.2. A 3D model has been developed for the purpose of the Daylight, Sunlight and Overshadowing Assessment. This model has been based on the drawings (drawing package Ref: "Northfield hostel – drawings, TRANSMITTAL ID: 00029", received on 4th October 2021; "3679 Northfield - updated floor Plans, TRANSMITTAL ID: 00028 ", received on 21st September 2021; and, drawing number "3679 - LB - ZZ - 00 - DP - A - 002", received on 8th October 2021) provided by Levitt Bernstein Architects between September and October 2021 and includes the surrounding area within a radius of approximately 150m around the Site. The model of the adjacent properties of the Site has been complimented with the available satellite mapping and photographs.
- 3.1.3. The assessment of impacts to the existing adjacent surroundings is based on a direct comparison between the Baseline condition and the Proposed scenario.
- 3.1.4. For the purposes of this assessment the 'Baseline condition' has been assumed to be the existing buildings on Site and the existing surrounding properties fronting the Site which are likely to experience a change in the level of natural light.
- 3.1.5. In the 'Proposed scenario' the Proposed Development is introduced on the Site replacing the existing buildings on Site for a direct comparison. This approach allows determining the impact that the Proposed Development will have on the surrounding properties in terms of daylight, sunlight and overshadowing.

#### **METRICS FOR THE ASSESSMENT OF LOSS OF LIGHT TO EXISTING PROPERTIES**

- 3.1.6. The BRE Guide uses a set of metrics to quantify the potential effect on daylight levels including:
- Obstruction Angle (25°)
  - Vertical Sky Component (VSC).

#### **Obstruction Angle**

- 3.1.7. This is an initial check to identify any potential impacts. If any part of a new building or extension, measured in a vertical section perpendicular to a main window wall of an existing building, from the centre of the lowest window, subtends an angle of more than 25° to the horizontal, then the diffuse daylighting of the existing building may be adversely affected and further detailed studies should be carried out.

## Vertical Sky Component

- 3.1.8. When the obstruction angle and the visible sky angle ( $\theta$ ) vary significantly when multiple windows are involved, then the Vertical Sky Component (VSC) may be used instead. The calculation of VSC usually requires specialist computer software. The VSC, in simple terms, measures the amount of sky that can be viewed from the centre of a window accounting for all external obstructions, (with 40% being the maximum value for an unobstructed window). The minimum recommended figure for VSC is 27% or greater to maintain good levels of daylight. For existing surrounding windows if the VSC is lower, then a comparison of existing and proposed VSC levels with the new development in place is calculated.

## Probable Sunlight hours

- 3.1.9. Access to sunlight is measured from the windows of habitable rooms, facing within 90° of due south. The Probable Sunshine Hours (PSH) calculation method measures the proportion of the window assessed that is sunlit for a period of time. The BRE Guide and BS 8206-02 recommend that the PSH is calculated for the annum (APSH) and for the winter months (WPSH) (21st September to 21st March). The recommended sunlight criteria for existing buildings are as follows:
- The window reference point should receive more than 25% of APSH, including at least 5% of WPSH.
  - If the available sunlight hours are both less than the amount given above and less than 0.8 times their former value, either over the whole year or during the winter, then the occupants of the existing building will notice some loss of sunlight.
  - The overall loss of sunlight should be maintained below 4%.

## Overshadowing of Existing Open Amenity Spaces

- 3.1.10. For gardens or amenity areas, the BRE Guide suggests that at least half the area (50%) should receive at least two hours of sunlight on 21<sup>st</sup> March (sunlight at an altitude of 10° or less is excluded). If as a result of a new development, an existing garden (usually the main back garden of a house) or amenity area does not meet the above criteria and the area which can receive two hours of sunlight on 21st March is less than 0.8 times its former value, then the loss of sunlight is likely to be significant. The above guidance applies both to new gardens and amenity areas.

## METRICS FOR THE ASSESSMENT OF INTERIOR DAYLIGHTING IN NEW DWELLINGS

### Average Daylight Factor

- 3.1.11. The Average Daylight Factor (ADF) calculations have been carried out to assess the proposed units within the proposed scheme. The CIBSE Guide LG10 defines the Average Daylight Factor as:
- '...the measure of the amount of skylight in a room. If the room is not too deep or obstructed, an average daylight factor of 5% or more will ensure that an interior looks substantially daylight, except early in the morning, late in the afternoon or on exceptionally dull days. An average daylight factor below 2% generally makes a room look dull; electric lighting is likely to be in frequent use.'*
- 3.1.12. In dwellings, the following minimum ADF values should be achieved as per the BS 8206-02 (BSI, 1992):
- 1% in bedrooms;

- 1.5% in living rooms;
- 2% in kitchens; and,
- where living and kitchens are integrated into one room, 2% should be used as the target.

3.1.13. The ADF calculations have been carried out for the proposed units based on the drawings as described in paragraph 3.1.2. Glazing transmittance and surface reflectance values have been adopted from BS 8206-2:2008, Annex A, table A.1-A.6 and CIBSE LG10: Daylighting — a guide for designers, Appendix 1: Properties of various glass types (CIBSE, 2006b). These values are shown in Table 3-1.

**Table 3-1– Reflectance values assumptions**

<b>Reflectance Values</b>	
Average reflectance of surroundings, internal walls, ceiling and floor	0.50
<b>Transmittance Values</b>	
Glazing Light Transmittance	70%*

\*Additional framing and maintenance factors have been applied.

3.1.14. For floor-to-ceiling windows a reduction factor has been applied for the portion of window below the working plane height of 850 mm, in line with the BRE Guidelines.

### **Probable Sunlight Hours within New Dwellings**

In new developments, each dwelling should ideally have at least one main living room within 90° of due south to receive a reasonable amount of sunlight. The recommended sunlight criteria that the window reference point should receive more than 25% of APSH and at least 5% of WPSH.

### **Overshadowing of New Open Amenity Spaces**

For gardens or amenity areas, the BRE Guide suggests that at least half the area (50%) should receive at least two hours of sunlight on 21<sup>st</sup> March (sunlight at an altitude of 10° or less is excluded).

## **3.2. ASSESSMENT MODELLING**

3.2.1. The daylight and sunlight calculations have been undertaken using specialist software Radiance, a full ray-tracing lighting simulation tool. A three-dimensional CAD model comprising the existing surroundings of the Site and the Proposed Development has been used for the assessments.

3.2.2. A three-dimensional CAD model of the Site and surrounding buildings has been constructed using the desk-based research of drawings provided by the design team and supplemented with the mapping database ArcGIS and available aerial photographic data for the area.

3.2.3. The 3D model constructed for the study is illustrated in Figures 3-1 and 3-2 below.



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# 1. INTRODUCTION

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- 1.1.4. The Site is highlighted by the redline boundary shown in Figure 1-1 below.

**Figure 1-1– Site Plan**



## 2. PLANNING POLICY AND GUIDANCE

---

### 2.1. POLICY CONTEXT

#### LEGISLATIVE FRAMEWORK

- 2.1.1. There is no applicable legislation of relevance to this assessment.

#### NATIONAL PLANNING POLICY FRAMEWORK

- 2.1.2. National Planning Policy Framework (Ref.1) refers to daylight, sunlight and overshadowing in para 125 (c) of section 11. Making Effective Use of Land:

*“125. 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:*

*(c) 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).”*

- 2.1.3. Most Local Authorities in the UK recognise the guidelines set out in the BRE Guide Site Layout Planning for Daylight and Sunlight, A Guide to Good Practice (Ref.2) as the most appropriate method for daylight, sunlight and overshadowing assessments.

#### GUIDANCE

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- 2.1.4. The BRE Guide: Site Layout Planning for Daylight and Sunlight, A Guide to Good Practice (Ref. 2) is recognised as the most appropriate method for daylight, sunlight and overshadowing assessments. These guidelines were first published in 1991 and superseded the 1971 Department of the Environment Document Sunlight and Daylight. The latest edition was published in 2011.
- 2.1.5. Whilst the BRE Guide provides numerical guidelines for daylight, sunlight and overshadowing, the Guide is not an instrument of planning policy, therefore some level of flexibility should be applied where appropriate.
- 2.1.6. The BRE document also includes advice for interior daylight although the recommendations contained within the guide are referred from the BS 8206-2 Code of practice for daylighting (Ref 3), and from the CIBSE publication Daylighting and window design (Ref 4) which give guidance on the design of buildings for good interior daylighting. The advice given in the BRE Guide is intended to be used in conjunction with these two documents as these focus on interior daylighting while the BRE Guide complements them by providing advice on the impacts on the external environment.

### 3. METHODOLOGY & CRITERIA

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- 3.1.1. The assessment has been carried out to verify the level of adherence to the recommended BRE Criteria: Daylight and Sunlight Assessment within the Proposed Development as well as Daylight and Sunlight Impact of the Proposed Development on the existing adjacent properties. The BRE Guide gives criteria and methods for calculating daylight and sunlight both within new developments and the impact on existing surrounding windows.
- 3.1.2. A 3D model has been developed for the purpose of the Daylight, Sunlight and Overshadowing Assessment. This model has been based on the drawings (drawing package Ref: “Northfield hostel – drawings, TRANSMITTAL ID: 00029”, received on 4th October 2021; “3679 Northfield - updated floor Plans, TRANSMITTAL ID: 00028 ”, received on 21st September 2021; and, drawing number “3679 - LB - ZZ - 00 - DP - A - 002”, received on 8th October 2021) provided by Levitt Bernstein Architects between September and October 2021 and includes the surrounding area within a radius of approximately 150m around the Site. The model of the adjacent properties of the Site has been complimented with the available satellite mapping and photographs.
- 3.1.3. The assessment of impacts to the existing adjacent surroundings is based on a direct comparison between the Baseline condition and the Proposed scenario.
- 3.1.4. For the purposes of this assessment the ‘Baseline condition’ has been assumed to be the existing buildings on Site and the existing surrounding properties fronting the Site which are likely to experience a change in the level of natural light.
- 3.1.5. In the ‘Proposed scenario’ the Proposed Development is introduced on the Site replacing the existing buildings on Site for a direct comparison. This approach allows determining the impact that the Proposed Development will have on the surrounding properties in terms of daylight, sunlight and overshadowing.

#### **METRICS FOR THE ASSESSMENT OF LOSS OF LIGHT TO EXISTING PROPERTIES**

- 3.1.6. The BRE Guide uses a set of metrics to quantify the potential effect on daylight levels including:
- Obstruction Angle (25°)
  - Vertical Sky Component (VSC).

#### **Obstruction Angle**

- 3.1.7. This is an initial check to identify any potential impacts. If any part of a new building or extension, measured in a vertical section perpendicular to a main window wall of an existing building, from the centre of the lowest window, subtends an angle of more than 25° to the horizontal, then the diffuse daylighting of the existing building may be adversely affected and further detailed studies should be carried out.



## Vertical Sky Component

- 3.1.8. When the obstruction angle and the visible sky angle ( $\theta$ ) vary significantly when multiple windows are involved, then the Vertical Sky Component (VSC) may be used instead. The calculation of VSC usually requires specialist computer software. The VSC, in simple terms, measures the amount of sky that can be viewed from the centre of a window accounting for all external obstructions, (with 40% being the maximum value for an unobstructed window). The minimum recommended figure for VSC is 27% or greater to maintain good levels of daylight. For existing surrounding windows if the VSC is lower, then a comparison of existing and proposed VSC levels with the new development in place is calculated.

## Probable Sunlight hours

- 3.1.9. Access to sunlight is measured from the windows of habitable rooms, facing within 90° of due south. The Probable Sunshine Hours (PSH) calculation method measures the proportion of the window assessed that is sunlit for a period of time. The BRE Guide and BS 8206-02 recommend that the PSH is calculated for the annum (APSH) and for the winter months (WPSH) (21st September to 21st March). The recommended sunlight criteria for existing buildings are as follows:
- The window reference point should receive more than 25% of APSH, including at least 5% of WPSH.
  - If the available sunlight hours are both less than the amount given above and less than 0.8 times their former value, either over the whole year or during the winter, then the occupants of the existing building will notice some loss of sunlight.
  - The overall loss of sunlight should be maintained below 4%.

## Overshadowing of Existing Open Amenity Spaces

- 3.1.10. For gardens or amenity areas, the BRE Guide suggests that at least half the area (50%) should receive at least two hours of sunlight on 21<sup>st</sup> March (sunlight at an altitude of 10° or less is excluded). If as a result of a new development, an existing garden (usually the main back garden of a house) or amenity area does not meet the above criteria and the area which can receive two hours of sunlight on 21st March is less than 0.8 times its former value, then the loss of sunlight is likely to be significant. The above guidance applies both to new gardens and amenity areas.

## METRICS FOR THE ASSESSMENT OF INTERIOR DAYLIGHTING IN NEW DWELLINGS

### Average Daylight Factor

- 3.1.11. The Average Daylight Factor (ADF) calculations have been carried out to assess the proposed units within the proposed scheme. The CIBSE Guide LG10 defines the Average Daylight Factor as:
- '...the measure of the amount of skylight in a room. If the room is not too deep or obstructed, an average daylight factor of 5% or more will ensure that an interior looks substantially daylight, except early in the morning, late in the afternoon or on exceptionally dull days. An average daylight factor below 2% generally makes a room look dull; electric lighting is likely to be in frequent use.'*
- 3.1.12. In dwellings, the following minimum ADF values should be achieved as per the BS 8206-02 (BSI, 1992):
- 1% in bedrooms;

- 1.5% in living rooms;
- 2% in kitchens; and,
- where living and kitchens are integrated into one room, 2% should be used as the target.

3.1.13. The ADF calculations have been carried out for the proposed units based on the drawings as described in paragraph 3.1.2. Glazing transmittance and surface reflectance values have been adopted from BS 8206-2:2008, Annex A, table A.1-A.6 and CIBSE LG10: Daylighting — a guide for designers, Appendix 1: Properties of various glass types (CIBSE, 2006b). These values are shown in Table 3-1.

**Table 3-1– Reflectance values assumptions**

<b>Reflectance Values</b>	
Average reflectance of surroundings, internal walls, ceiling and floor	0.50
<b>Transmittance Values</b>	
Glazing Light Transmittance	70%*

\*Additional framing and maintenance factors have been applied.

3.1.14. For floor-to-ceiling windows a reduction factor has been applied for the portion of window below the working plane height of 850 mm, in line with the BRE Guidelines.

### **Probable Sunlight Hours within New Dwellings**

In new developments, each dwelling should ideally have at least one main living room within 90° of due south to receive a reasonable amount of sunlight. The recommended sunlight criteria that the window reference point should receive more than 25% of APSH and at least 5% of WPSH.

### **Overshadowing of New Open Amenity Spaces**

For gardens or amenity areas, the BRE Guide suggests that at least half the area (50%) should receive at least two hours of sunlight on 21<sup>st</sup> March (sunlight at an altitude of 10° or less is excluded).

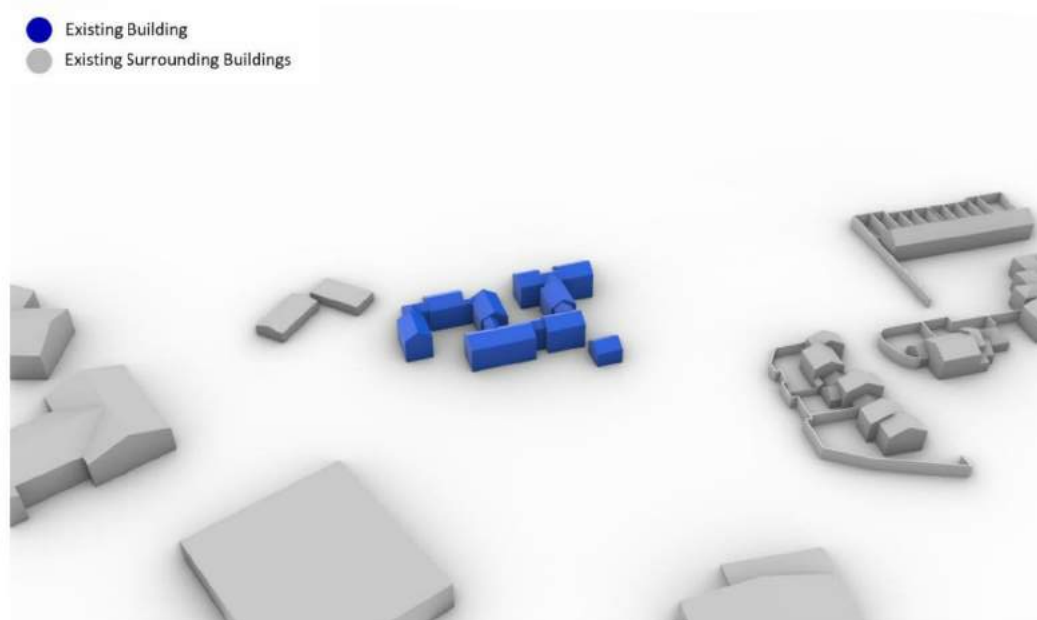
## **3.2. ASSESSMENT MODELLING**

3.2.1. The daylight and sunlight calculations have been undertaken using specialist software Radiance, a full ray-tracing lighting simulation tool. A three-dimensional CAD model comprising the existing surroundings of the Site and the Proposed Development has been used for the assessments.

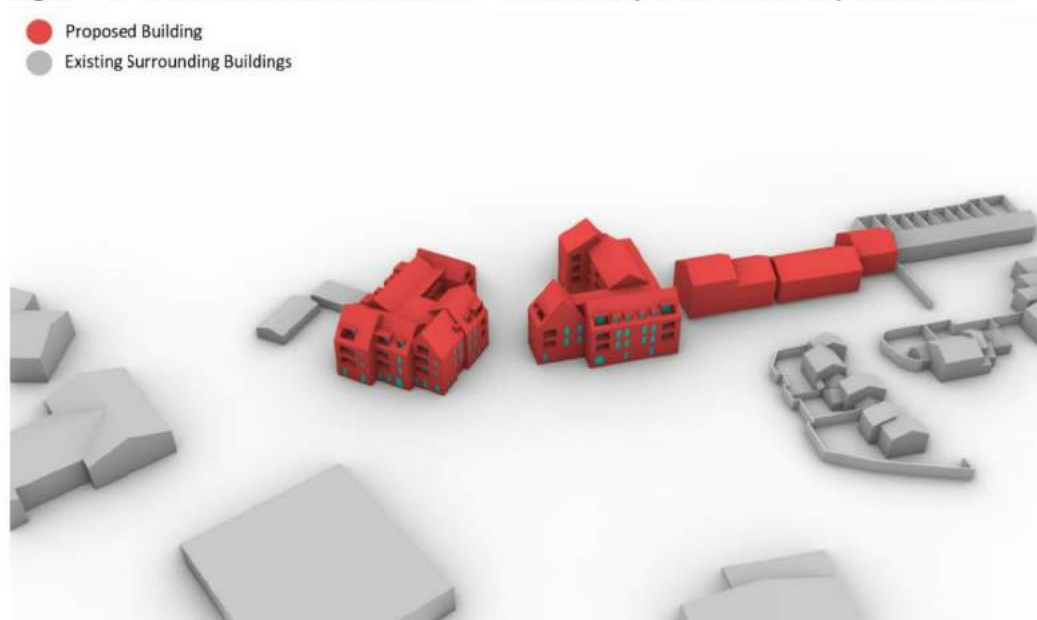
3.2.2. A three-dimensional CAD model of the Site and surrounding buildings has been constructed using the desk-based research of drawings provided by the design team and supplemented with the mapping database ArcGIS and available aerial photographic data for the area.

3.2.3. The 3D model constructed for the study is illustrated in Figures 3-1 and 3-2 below.

**Figure 3-1– 3D Model for the Assessment – South Perspective of the Baseline Scenario**



**Figure 3-2– 3D Model for the Assessment – South Perspective of the Proposed Scenario**



### 3.3. SENSITIVE RECEPTORS FOR ASSESSMENT

- 3.3.1. The BRE guidelines focus mostly on residential buildings and the emphasis throughout the guide is on safeguarding natural light to existing dwellings. A receptor sensitivity rating has been developed using professional judgement, which is described below and categorised into high, medium and low based on the function or use of the space being assessed.
- 3.3.2. Residential buildings require suitable levels of daylight, adequate to their function. Windows to such building types are classified as having high sensitivity to daylight and sunlight.

- 3.3.3. The guidelines may also be applied to existing non-domestic buildings where the occupants have a reasonable expectation of daylight, including hotels, hostels and student accommodations.
- 3.3.4. Schools and hospitals are also associated with good levels of natural light and have been classified as having high sensitivity to daylight and sunlight.
- 3.3.5. Office buildings tend to rely on supplementary artificial lighting and have been classified as having a medium sensitivity to daylight and sunlight.
- 3.3.6. Retail units usually rely on mechanical control and are not considered spaces with an expectation of daylight or sunlight by the user. Thus, windows to such spaces can be classified as having a low sensitivity and excluded from this assessment.
- 3.3.7. For the purpose of this assessment, receptors with high sensitivity have been considered, i.e. only residential, schools and student accommodations. Specifically, the receptors identified for the impact assessment are listed in Tables 3-2, 3-3 and 3-4, and shown in Figures 3-3 and 3-4 below.
- 3.3.8. The receptors for the assessment are selected on the basis of their location relative to the Site, anticipating the receptors whose level of daylight and sunlight are likely to change as a result of the Proposed Development and also depending on their sensitivity to natural light.

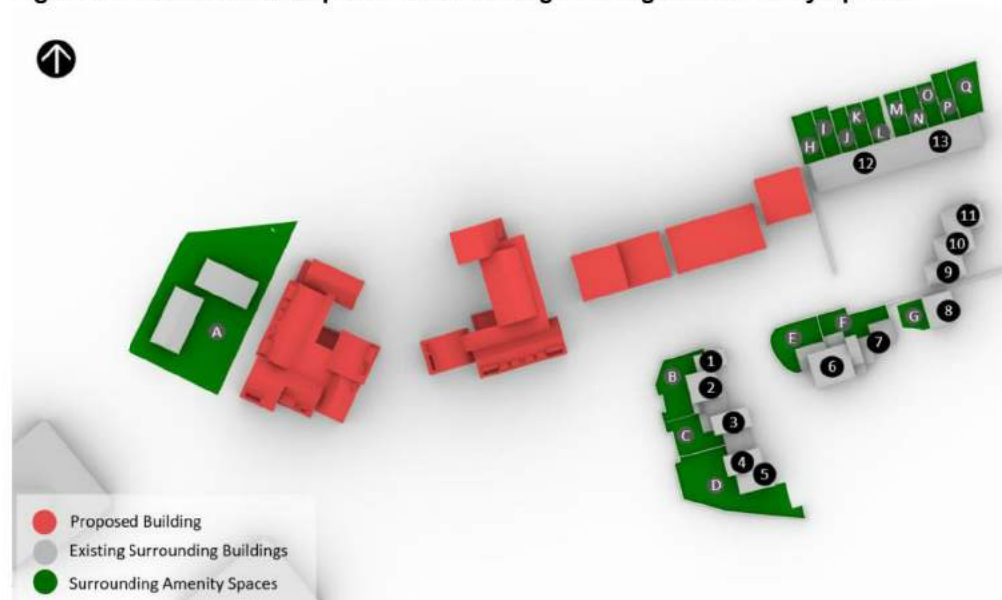
**Table 3-2 – Sensitive Receptors for the Impact Assessment - Buildings**

No.	Receptor	No. of Windows	Use	Sensitivity
1	2 Bampton Close	6	Residential	High
2	4 Bampton Close	12	Residential	High
3	6 Bampton Close	8	Residential	High
4	8 Bampton Close	3	Residential	High
5	10 Bampton Close	4	Residential	High
6	1 Bampton Close	5	Residential	High
7	3 Bampton Close	5	Residential	High
8	5 Bampton Close	2	Residential	High
9	26-28 Bampton Close	3	Residential	High
10	30-32 Bampton Close	3	Residential	High
11	34-36 Bampton Close	5	Residential	High
12	15-23 Bampton Close	15	Residential	High
13	25-33 Bampton Close	15	Residential	High
<b>TOTAL</b>		86		

**Table 3-3 – Sensitive Receptors for Impact Assessment - Amenity Spaces of Adjacent Properties**

No.	Receptor	Use	Sensitivity
A	Sandy Lane_Halls_Amenity area	Private Amenity Space	Medium
B	2-4 Bampton Close_Amenity area	Private Amenity Space	High
C	6 Bampton Close_Amenity area	Private Amenity Space	High
D	8-10 Bampton Close_Amenity area	Private Amenity Space	High
E	1 Bampton Close_Amenity area	Private Amenity Space	High
F	3 Bampton Close_Amenity area	Private Amenity Space	High
G	5 Bampton Close_Amenity area	Private Amenity Space	High
H	15 Bampton Close_Amenity area	Private Amenity Space	High
I	17 Bampton Close_Amenity area	Private Amenity Space	High
J	19 Bampton Close_Amenity area	Private Amenity Space	High
K	21 Bampton Close_Amenity area	Private Amenity Space	High
L	23 Bampton Close_Amenity area	Private Amenity Space	High
M	25 Bampton Close_Amenity area	Private Amenity Space	High
N	27 Bampton Close_Amenity area	Private Amenity Space	High
O	29 Bampton Close_Amenity area	Private Amenity Space	High
P	31 Bampton Close_Amenity area	Private Amenity Space	High
Q	33 Bampton Close_Amenity area	Private Amenity Space	High

**Figure 3-3 – Sensitive Receptors – Surrounding Buildings and Amenity Spaces**

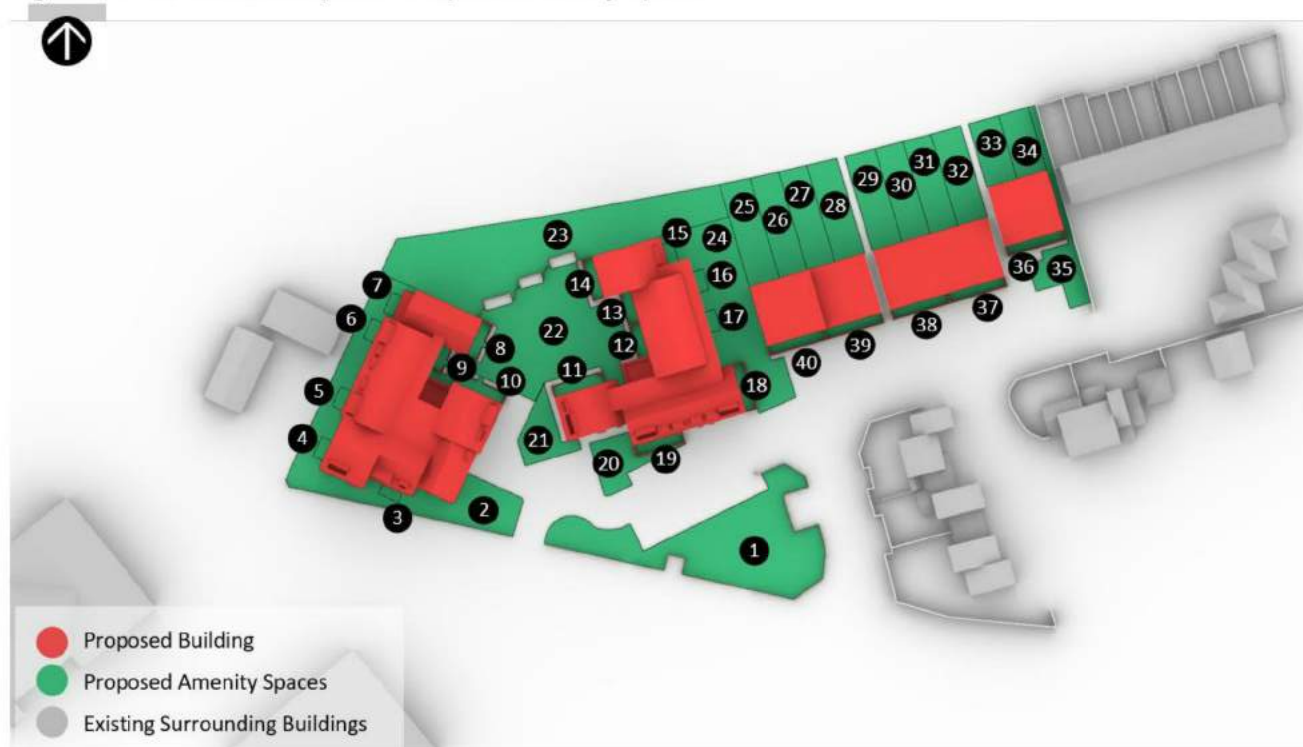


**Table 3-4 – Sensitive Receptors - Amenity Spaces of the Proposed Development**

No.	Receptor	Use	Sensitivity
1	South Planting and Communal Amenity	Pocket Amenity Space and Planting	Medium
2	West Lawn and Planting	Lawn and Planting Space	High
3	Plot A002 GF Terrace	Private Amenity Space	High
4	Plot A003 GF Terrace	Private Amenity Space	High
5	Plot A004 GF Terrace	Private Amenity Space	High
6	Plot A005 West GF Terrace	Private Amenity Space	High
7	Plot A006 West GF Terrace	Private Amenity Space	High
8	Plot A006 East GF Terrace	Private Amenity Space	High
9	Plot A005 East GF Terrace	Private Amenity Space	High
10	Plot A001 GF Terrace	Private Amenity Space	High
11	Plot B001 GF Terrace	Private Amenity Space	High
12	Plot B004 West GF Terrace	Private Amenity Space	High
13	Plot B005 West GF Terrace	Private Amenity Space	High
14	Plot B006 West GF Terrace	Private Amenity Space	High
15	Plot B006 East GF Terrace	Private Amenity Space	High
16	Plot B005 East GF Terrace	Private Amenity Space	High
17	Plot B004 East GF Terrace	Private Amenity Space	High
18	Plot B003 GF Terrace	Private Amenity Space	High
19	Plot B002 GF Terrace	Private Amenity Space	High
20	South Planting	Planting Space	High
21	South Planting	Planting Space	High
22	Central Communal Amenity	Private Amenity Space	High
23	North Planting	Planting Space	High
24	East Planting	Planting Space	High
25	Plot H01 Private Garden	Private Amenity Space	High
26	Plot H02 Private Garden	Private Amenity Space	High
27	Plot H03 Private Garden	Private Amenity Space	High

28	Plot H04 Private Garden	Private Amenity Space	High
29	Plot H05 Private Garden	Private Amenity Space	High
30	Plot H06 Private Garden	Private Amenity Space	High
31	Plot H07 Private Garden	Private Amenity Space	High
32	Plot H08 Private Garden	Private Amenity Space	High
33	Plot H09 Private Garden	Private Amenity Space	High
34	Plot H10 Private Garden	Private Amenity Space	High
35	East Planting	Planting Space	High
36	Plots H09-10 Front Garden	Private Amenity Space	High
37	Plots H07-08 Front Garden	Private Amenity Space	High
38	Plots H05-06 Front Garden	Private Amenity Space	High
39	Plots H03-04 Front Garden	Private Amenity Space	High
40	Plots H01-02 Front Garden	Private Amenity Space	High

Figure 3-4 – Sensitive Receptors – Proposed Amenity Spaces



### 3.4. IMPACT ASSESSMENT CRITERIA

3.4.1. BRE Guide recommendations are achieved if the levels of daylight / sunlight of the windows of the surrounding properties are equal to or over the values established by the Guide. BRE Guidelines are also met for the surrounding properties if the ratio of impact between the Baseline and the Proposed scenarios is 0.80 or higher, i.e. the reduction in daylight or sunlight hours is 20% or less. An additional criterion of up to 4% overall annual loss for APSH values also needs to be satisfied to meet the recommended BRE Guidelines.

3.4.2. For the affected receptors, the level of impact has been classified depending on the ratio of impact between the 'Baseline Scenario' and the 'Proposed Scenario'. The criteria used for determining the magnitude of change for the VSC, APSH and WPSH results are detailed below (Tables 3-5 to 3-7).

**Table 3-5 – Impact criteria for Vertical Sky Component (VSC) Results**

VSC Values	Ratio of Change from Baseline	Magnitude of Impact	Compliance/Breach of BRE Criteria
VSC ≥ 27%	n/a	Negligible	Compliant
VSC < 27%	> 0.8	Negligible	Compliant
VSC < 27%	0.7 – 0.8	Low	Breach
VSC < 27%	0.6 – 0.7	Medium	Breach
VSC < 27%	< 0.6	High	Breach

**Table 3-6 – Impact criteria for Annual Probable Sunlight Hours (APSH) Results**

APSH Values	Ratio of Change from Baseline	Absolute Reduction APSH	Magnitude of Impact	Compliance/Breach of BRE Criteria
APSH ≥ 25%	>0.8	n/a	Negligible	Compliant
APSH < 25%	>0.8	≤ 4%	Negligible	Compliant
APSH < 25%	>0.7	>4%	Low	Breach
APSH < 25%	0.6 – 0.7	>4%	Medium	Breach
APSH < 25%	< 0.6	>4%	High	Breach

**Table 3-7 – Impact criteria for Winter Probable Sunlight Hours (WPSH) Results**

WPSH Values	Ratio of Change from Baseline	Magnitude of Impact	Compliance/Breach of BRE Criteria
WPSH ≥ 5%	n/a	Negligible	Compliant
WPSH < 5%	>0.8	Negligible	Compliant
WPSH < 5%	0.7 – 0.8	Low	Breach
WPSH < 5%	0.6 – 0.7	Medium	Breach
WPSH < 5%	< 0.6	High	Breach



## 4. IMPACT ASSESSMENT RESULTS

### 4.1. BASELINE CONDITION

- 4.1.1. An assessment of the Baseline condition has been carried out prior to the assessment of the impact of the Proposed Development. As described above, the Baseline condition has assessed the surrounding properties which may be impacted upon by the Proposed Development.
- 4.1.2. Figures 4-1, 4-2 and 4-3 provide a graphical representation of the VSC results for the windows of properties adjacent to the Site.

**Figure 4-1 - Baseline Model Compliance Criteria: VSC $\geq$  27% (South-west View)**

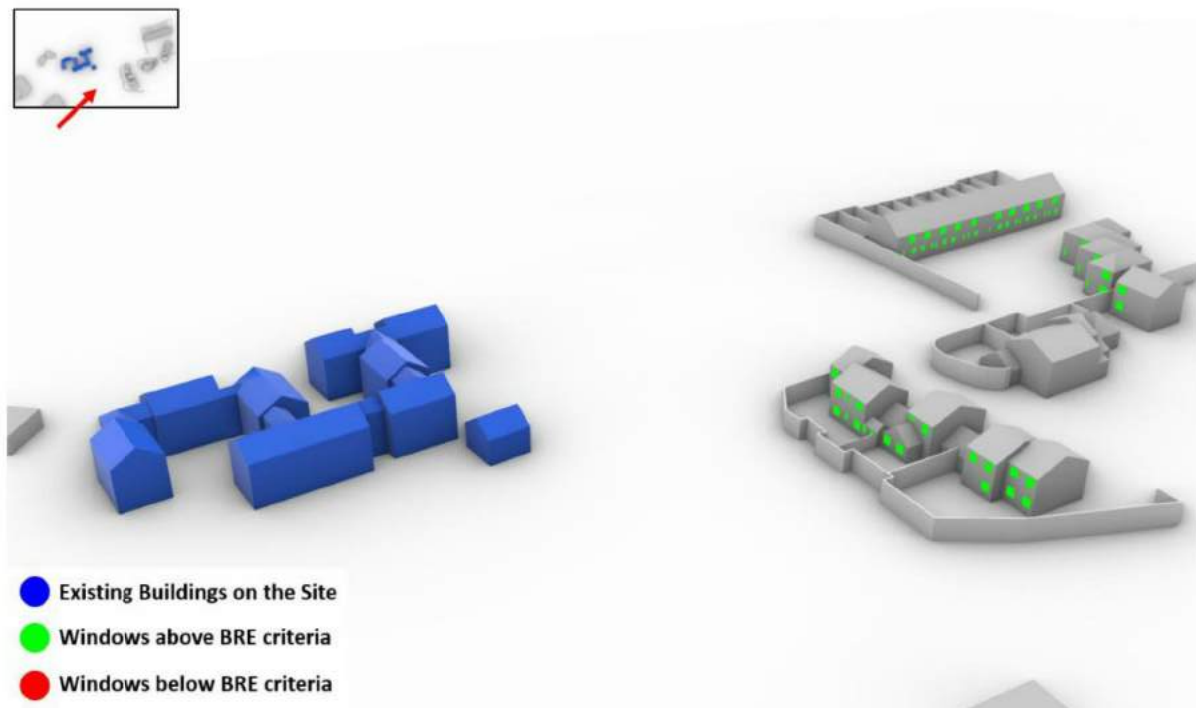


Figure 4-2 - Baseline Model Compliance Criteria: VSC $\geq$  27% (North-west View)

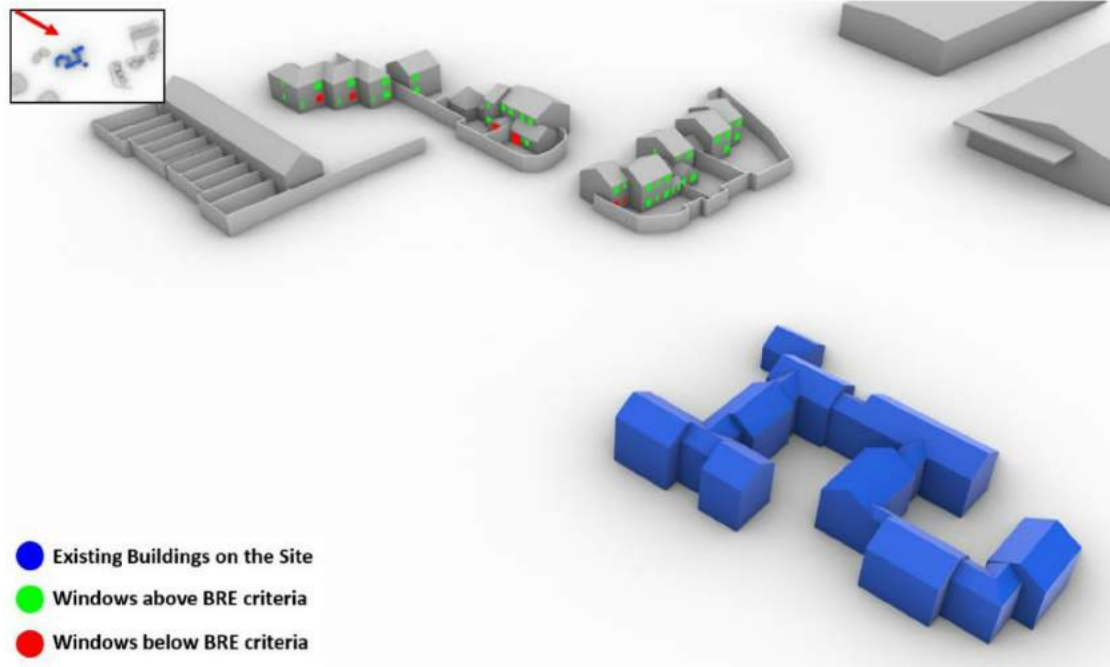
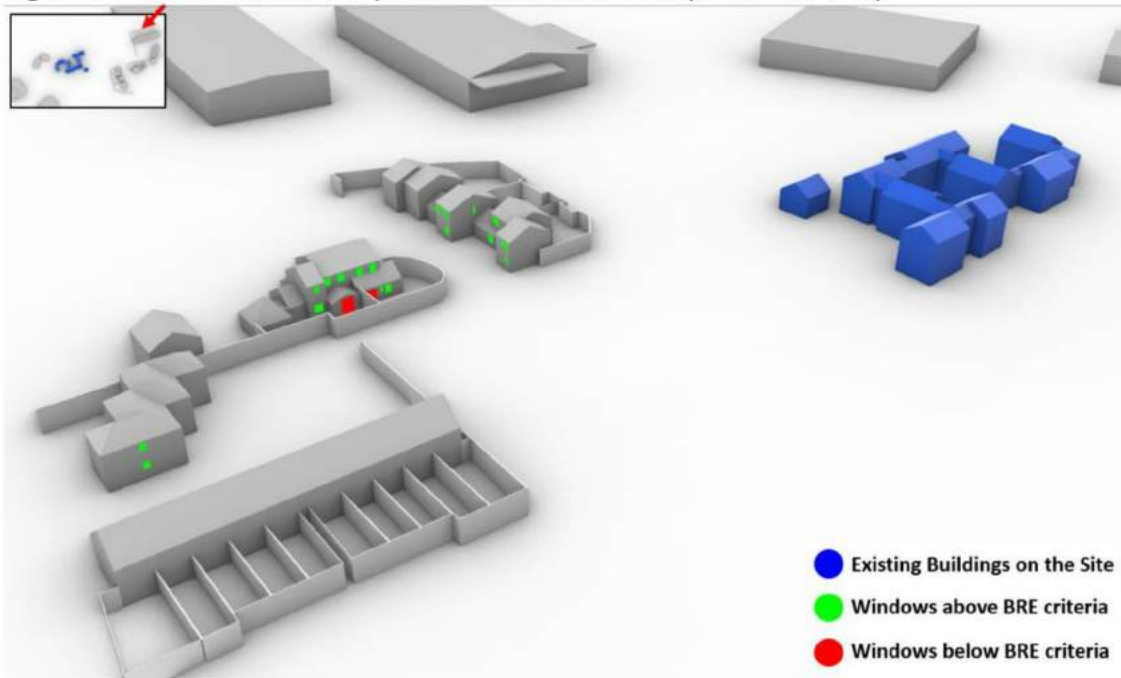


Figure 4-3 - Baseline Model Compliance Criteria: VSC $\geq$  27% (North-east View)



4.1.3. The results of the Baseline Scenario show that approximately 91% of the windows (79 windows out of 86 tested) are within the recommended daylight criteria, i.e. with VSC values above 27%. Most windows are below the VSC Criteria partly due to their own self-shading geometry and/or to the close proximity between buildings (high-density area), which causes the reduce levels of VSC to some windows.

## 4.2. PROPOSED SCENARIO

4.2.1. In order to assess the effect of the Proposed Development, the model was updated by replacing the existing buildings on Site with the Proposed Development to represent the 'Proposed Scenario'. The geometry, position and massing of the Proposed Development has been based on the drawings provided by provided by Levitt Bernstein in October 2021. The results of the impact assessment of the Proposed Development on daylight and sunlight of the surrounding properties are summarised in Tables 4-1 and 4-2 and illustrated in Figures 4-4 to 4-6. The numerical information has been omitted due to the considerable number of results. However, this information is available upon request.

### THE OBSTRUCTION ANGLE

4.2.2. For most of the properties in direct proximity to the Site, the Proposed Development subtends less than 25° from the lowest window and therefore, the daylight on these properties is not likely to be significantly affected. Nevertheless, due to the close proximity to the Site, the obstruction angle at some of the windows indicate a possible impact. Therefore, a more detailed assessment was carried out using a 3D model.

### DAYLIGHT IMPACT ASSESSMENT

4.2.3. The results of the Daylight Impact Assessment of the Proposed Development on the existing windows, taking into account both the absolute level of VSC and the reduction from the Baseline conditions (ratio of impact), are summarised in Table 4-1 and illustrated in Figures 4-4, 4-5 and 4-6.

4.2.4. The results of the Daylight Impact Assessment indicated that in the proposed scenario, all of the properties around the site will retain suitable levels of daylight and sunlight. A total of 86 windows surrounding the Site were assessed to verify the amount of light reaching each window (through the Vertical Sky Component – VSC) both before and after the introduction of the Proposed Development.

4.2.5. The results showed that all 86 windows would retain suitable levels of daylight either by keeping a VSC value of 27% or greater, or by keeping a ratio of change of 0.8 or greater, as recommended by the BRE Guide.

**Table 4-1 – Summary of Magnitude of Change of Daylight Receptor (VSC)**

Receptor		Windows	Meet BRE Criteria		Does Not Meet BRE Criteria					
					Low		Medium		High	
Num	Name	Num	Num	%	Num	%	Num	%	Num	%
1	2 Bampton Close	6	6	100	0	0	0	0	0	0
2	4 Bampton Close	12	12	100	0	0	0	0	0	0
3	6 Bampton Close	8	8	100	0	0	0	0	0	0
4	8 Bampton Close	3	3	100	0	0	0	0	0	0
5	10 Bampton Close	4	4	100	0	0	0	0	0	0
6	1 Bampton Close	5	5	100	0	0	0	0	0	0
7	3 Bampton Close	5	5	100	0	0	0	0	0	0
8	5 Bampton Close	2	2	100	0	0	0	0	0	0

9	26-28 Bampton Close	3	3	100	0	0	0	0	0	0
10	30-32 Bampton Close	3	3	100	0	0	0	0	0	0
11	34-36 Bampton Close	5	5	100	0	0	0	0	0	0
12	15-23 Bampton Close	15	15	100	0	0	0	0	0	0
13	25-33 Bampton Close	15	15	100	0	0	0	0	0	0
<b>Total</b>		<b>Total</b>	<b>86</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Figure 4-4 - Proposed Model Daylight Assessment: VSC $\geq$  27% or Impact Ratio >0.8 (South-west View)

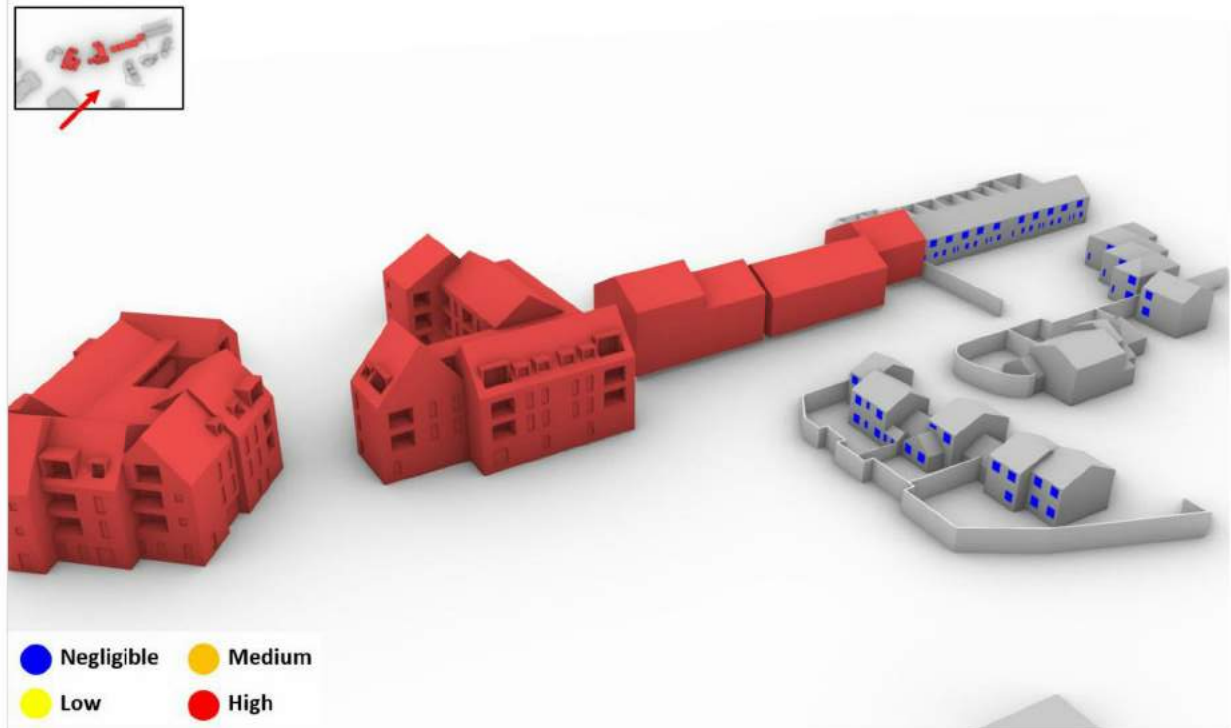


Figure 4-5 - Proposed Model Daylight Assessment: VSC $\geq$  27% or Impact Ratio  $>$ 0.8 (North-west View)

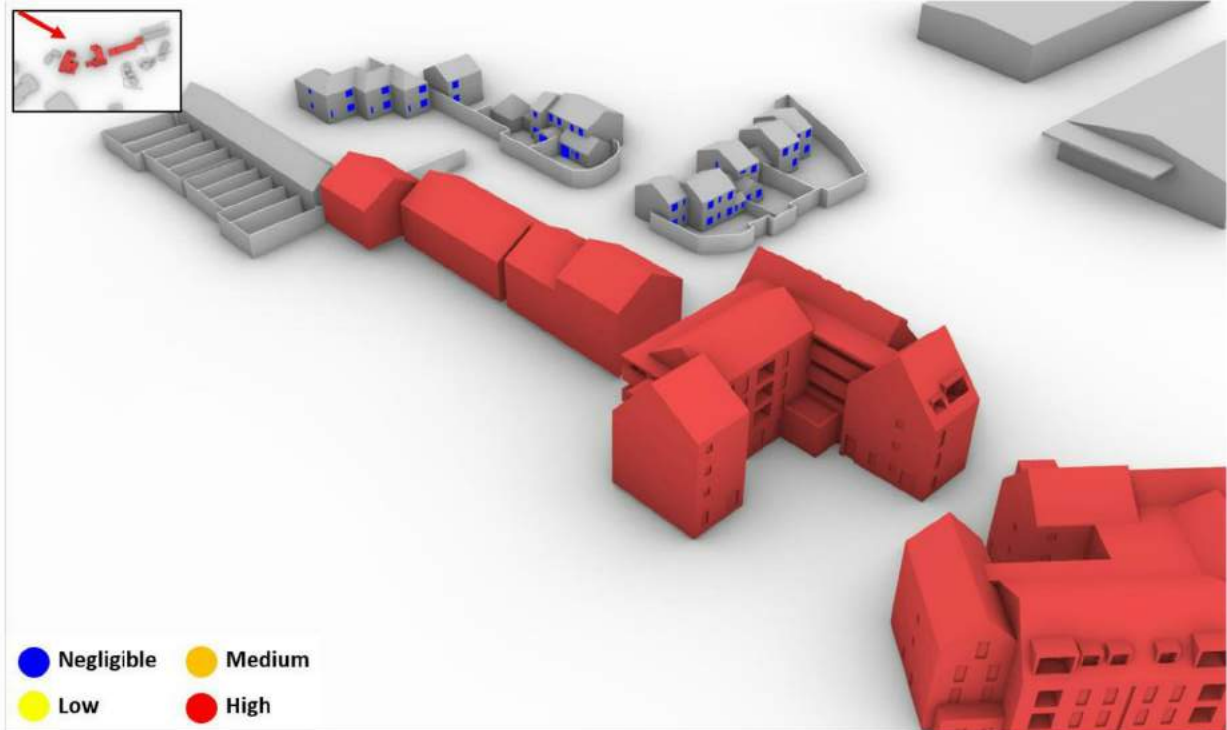
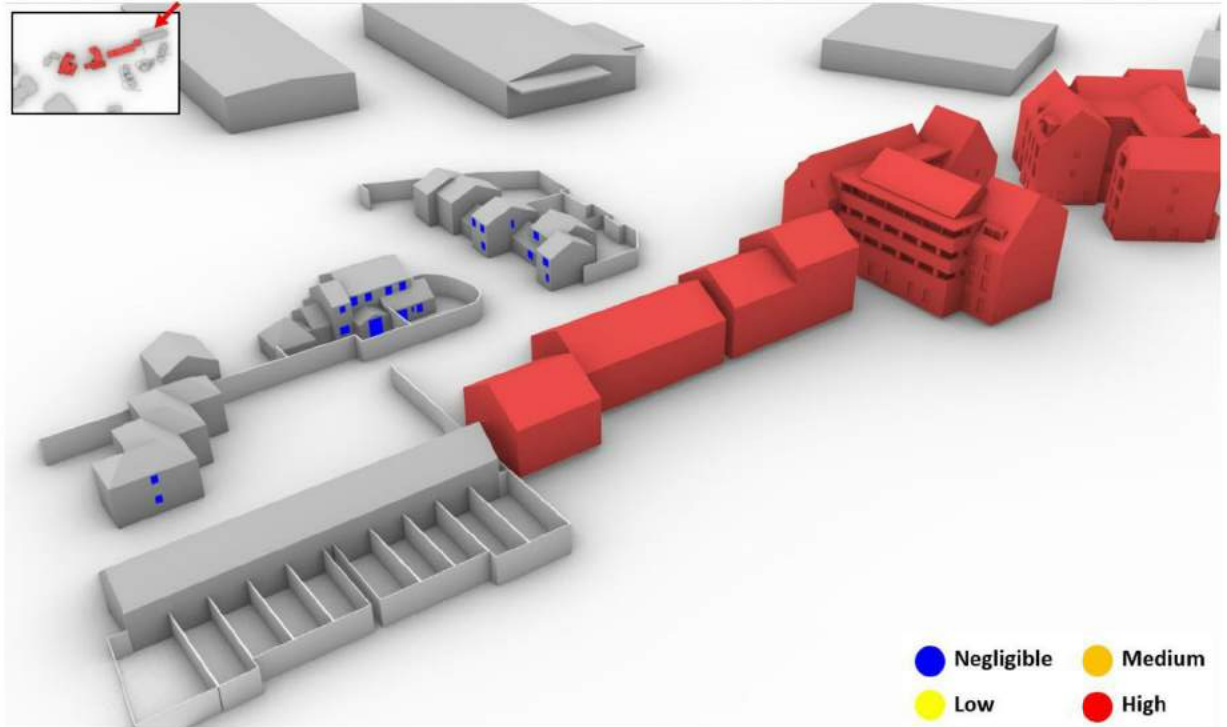


Figure 4-6 - Proposed Model Daylight Assessment: VSC $\geq$  27% or Impact Ratio  $>$ 0.8 (North-east View)



## SUNLIGHT IMPACT ASSESSMENT

- 4.2.6. The Sunlight Impact Assessment focused on the receptors that have windows facing 90° of due south, in line with BRE Guide. The results are summarised in Table 4-2 below and illustrated in Figures 4-7, Figure 4-8. The table identifies the number of windows where the sunlight criteria are achieved both for the annual and winter assessments and the magnitude of change between the Baseline and Proposed scenarios.
- 4.2.7. The results of the Sunlight Impact Assessment showed that all of the assessed windows are with a negligible magnitude of change after the introduction of the Proposed Development and therefore, within the recommended threshold.
- 4.2.8. A total of 64 windows facing the Site were assessed, from which 100% showed suitable levels of sunlight.

**Table 4-2 – Summary of Magnitude of Change of Sunlight (APSH & WPSH) Impact Receptor**

Receptor		Windows	Meet BRE Criteria		Does Not Meet BRE Criteria					
					Low		Medium		High	
Num	Name	Num	Num	%	Num	%	Num	%	Num	%
1	2 Bampton Close	4	4	100	0	0	0	0	0	0
2	4 Bampton Close	8	8	100	0	0	0	0	0	0
3	6 Bampton Close	4	4	100	0	0	0	0	0	0
4	8 Bampton Close	3	3	100	0	0	0	0	0	0
5	10 Bampton Close	4	4	100	0	0	0	0	0	0
6	5 Bampton Close	2	2	100	0	0	0	0	0	0
7	26-28 Bampton Close	3	3	100	0	0	0	0	0	0
8	30-32 Bampton Close	3	3	100	0	0	0	0	0	0
9	34-36 Bampton Close	3	3	100	0	0	0	0	0	0
10	15-23 Bampton Close	15	15	100	0	0	0	0	0	0
11	25-33 Bampton Close	15	15	100	0	0	0	0	0	0
<b>Total</b>		<b>64</b>	<b>64</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Figure 4-7 - Impact of the Proposed Development on Sunlight to Existing Surrounding Windows (South-west View)

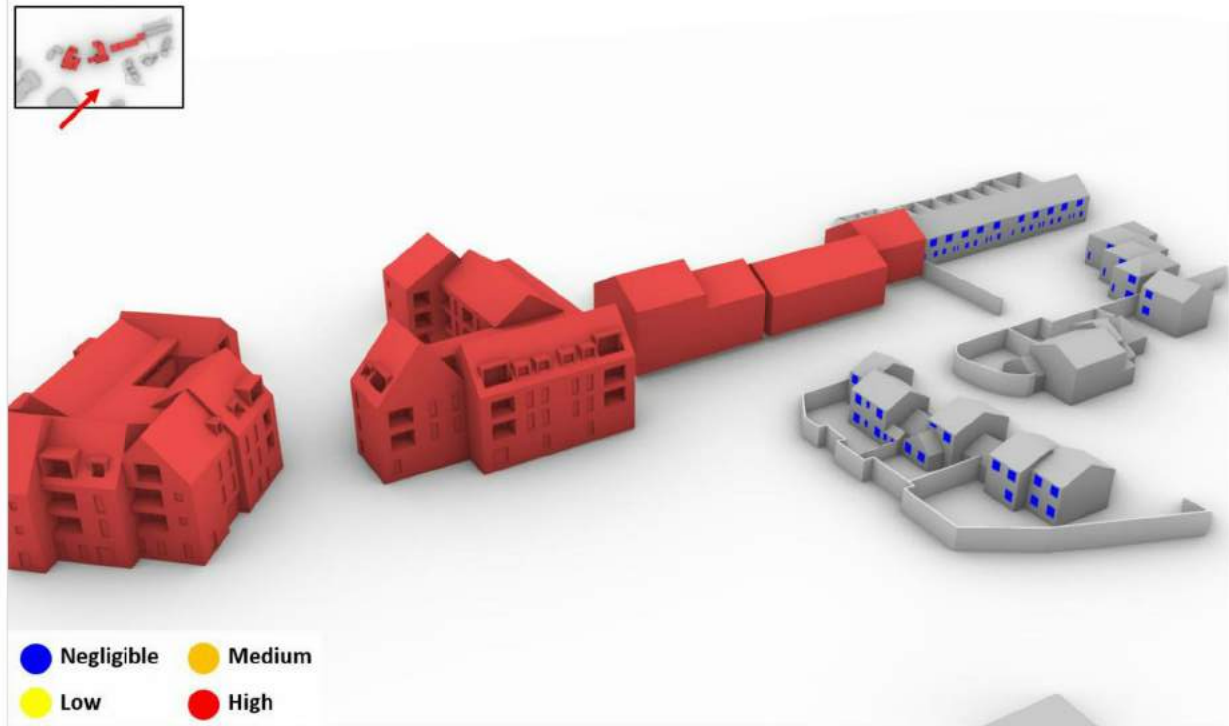
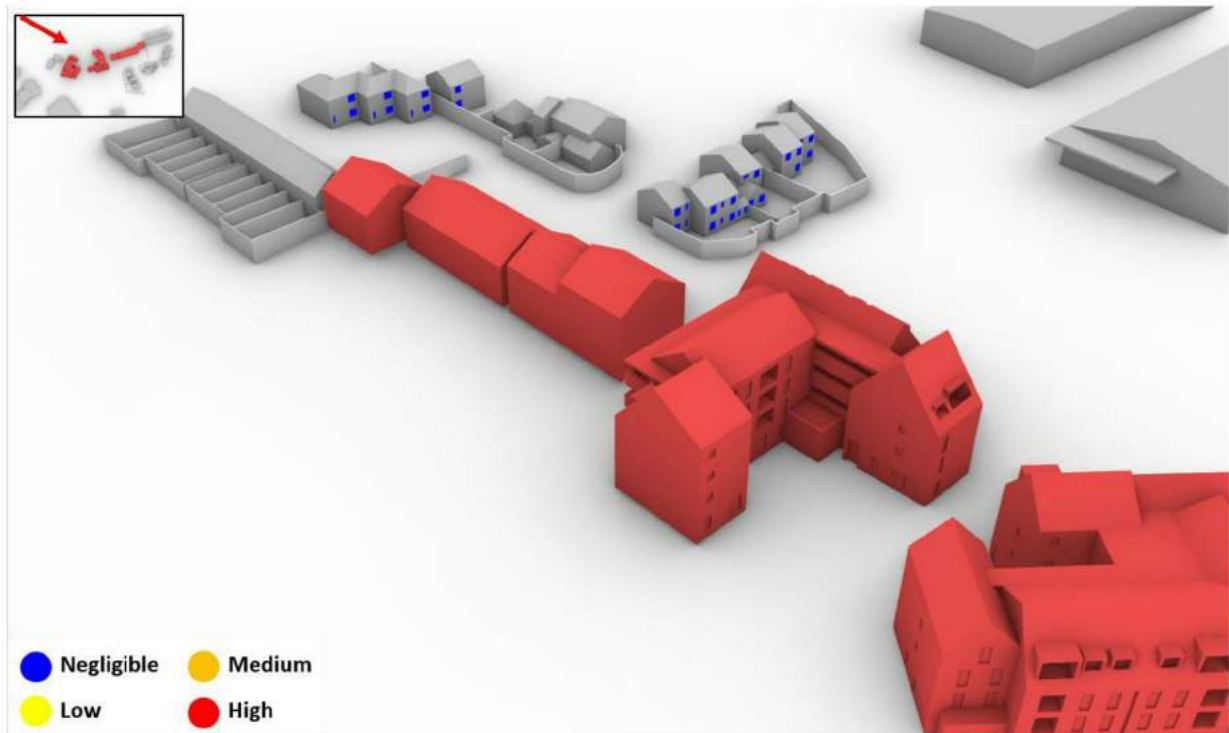


Figure 4-8 - Impact of the Proposed Development on Sunlight to Existing Surrounding Windows (North-west View)



## OVERSHADOWING ASSESSMENT

- 4.2.9. The Overshadowing Assessment focused on the existing open amenity spaces of the properties adjacent to the Proposed Development.
- 4.2.10. The results of the Overshadowing Assessment showed that all of the assessed amenity spaces receive 2 hours or more of sunlight on at least 50% of its area on 21st March, and therefore, meet the BRE recommendation.
- 4.2.11. The results of the BRE tests as well as the sunlight exposure plots on the 21st of March are summarized in Table 4-5 and presented in Figures 4-9 to 4-12 below.

**Table 4-3 – Overshadowing Results – Surrounding Amenity Spaces**

Receptor		Area that Receives at least 2 hs of Sun in 21st March		Ratio of Impact	Meet BRE Criteria?
No.	Name	Baseline (%)	Proposed (%)		
A	Sandy Lane_Halls_Amenity area	96.98	92.62	0.96	Yes
B	2-4 Bampton Close_Amenity area	81.93	81.93	1	Yes
C	6 Bampton Close_Amenity area	58.55	58.55	1	Yes
D	8-10 Bampton Close_Amenity area	68.03	68.03	1	Yes
E	1 Bampton Close_Amenity area	71.68	71.68	1	Yes
F	3 Bampton Close_Amenity area	50.19	50.19	1	Yes
G	5 Bampton Close_Amenity area	100	100	1	Yes
H	15 Bampton Close_Amenity area	42.56	35.84	0.84	Yes
I	17 Bampton Close_Amenity area	41.44	41.18	0.99	Yes
J	19 Bampton Close_Amenity area	33.85	33.85	1	Yes
K	21 Bampton Close_Amenity area	34.05	34.05	1	Yes
L	23 Bampton Close_Amenity area	36.79	36.79	1	Yes
M	25 Bampton Close_Amenity area	37.62	37.62	1	Yes
N	27 Bampton Close_Amenity area	38.53	38.53	1	Yes
O	29 Bampton Close_Amenity area	41.56	41.56	1	Yes
P	31 Bampton Close_Amenity area	48.74	48.74	1	Yes
Q	33 Bampton Close_Amenity area	67.56	67.56	1	Yes



Figure 4-9 - Sun Exposure – BRE Results Baseline Condition

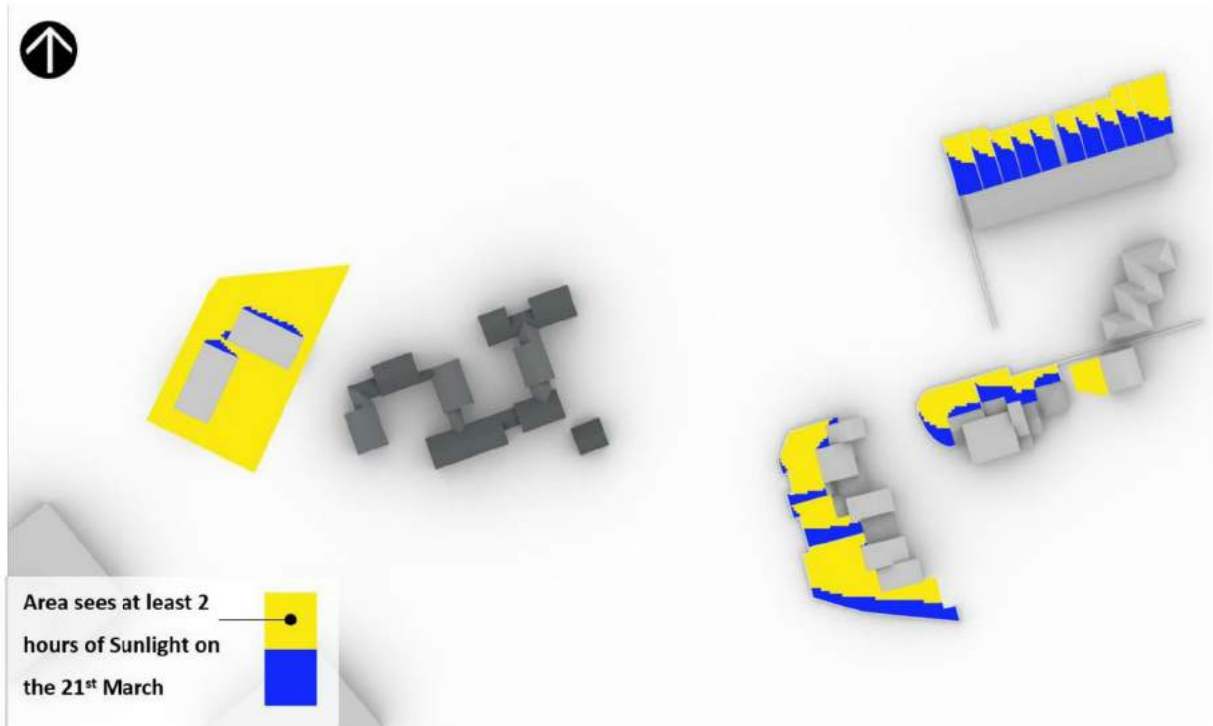


Figure 4-10 - Sun Exposure – BRE Results Proposed Scenario

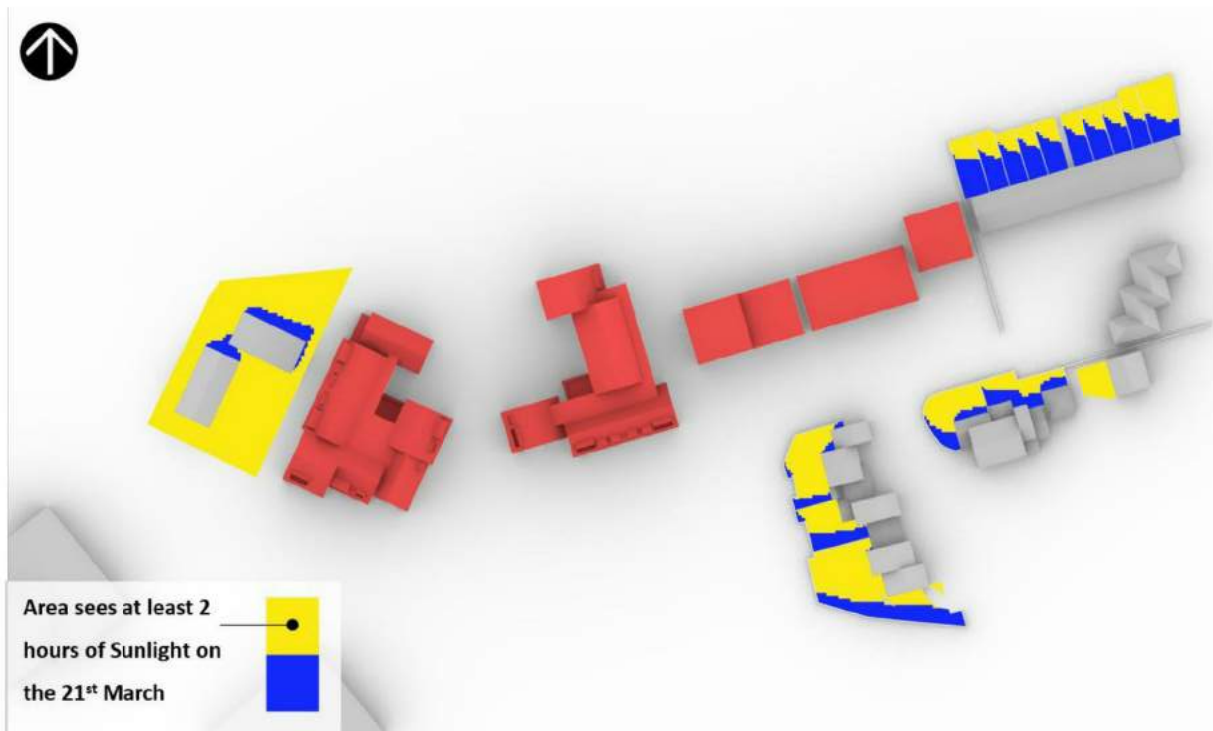


Figure 4-11 - Sun Hours on Ground – 21st March Results Baseline Conditions

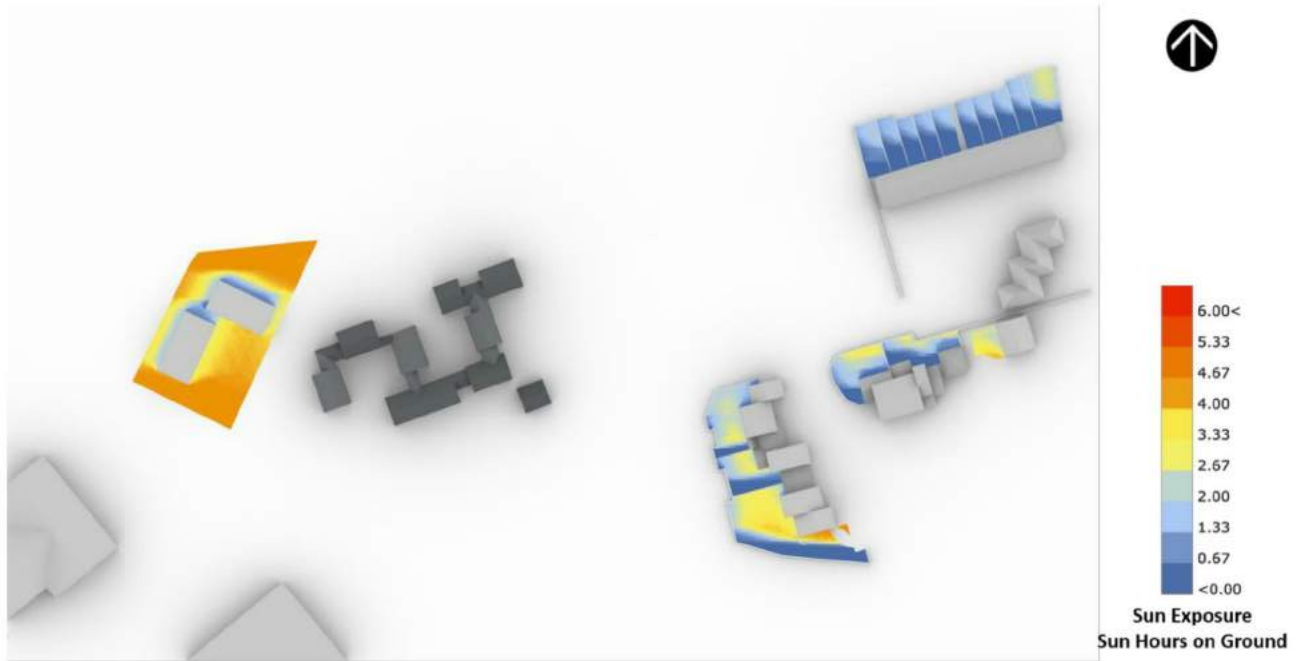
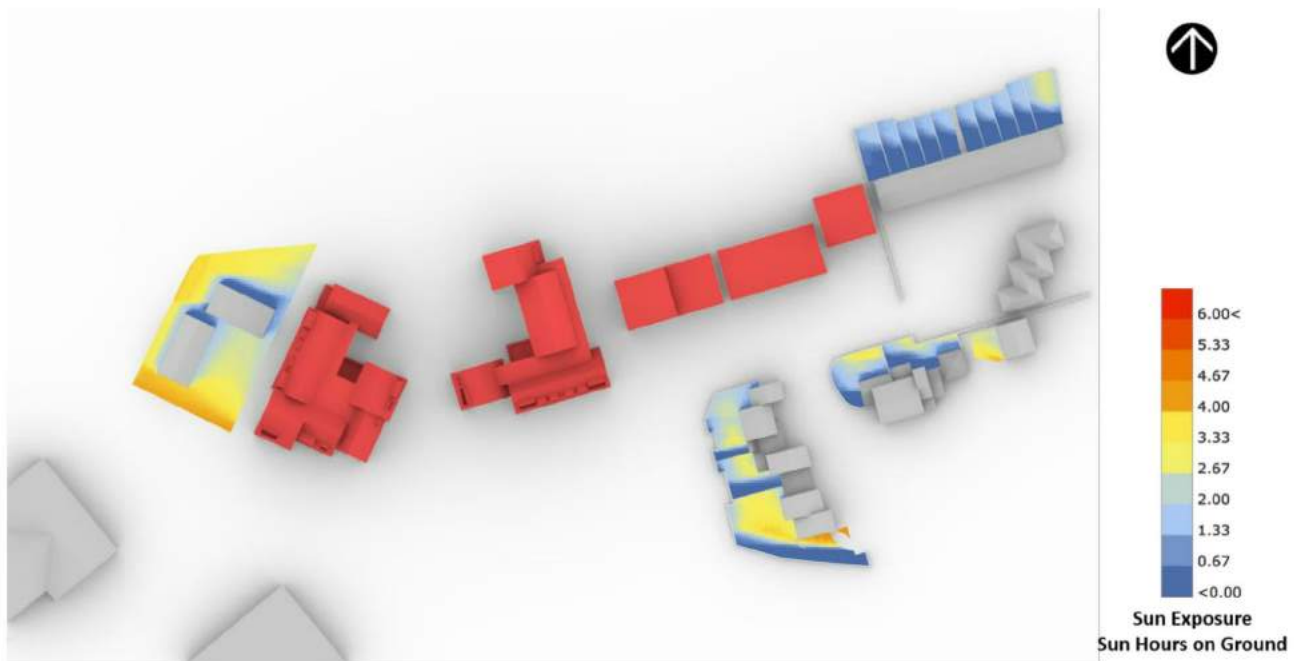


Figure 4-12 - Sun Hours on Ground – 21st March Results Proposed Scenario



## 5. PROPOSED DEVELOPMENT DAYLIGHT AND SUNLIGHT ASSESSMENT RESULTS

### INTERNAL DAYLIGHT ASSESSMENT

- 5.1.1. The Daylight Assessment for the internal spaces within the Proposed Development is a two-stepped process requiring initially the calculation of the VSC at the face of each window to assess the level of obstruction / availability of daylight in relation to the proposed massing and other obstructions such as balconies, fixed shading elements and surrounding buildings.
- 5.1.2. According to the BRE Guide, if the VSC is greater than 27%, standard window and room design will give reasonable ADF results. Where the VSC has fallen below 27%, the ADF within each room has been calculated, the results of which are summarised below in Tables 5-1 and 5-2 and Figure 5-1
- 5.1.3. The scheme includes three key types of habitable rooms where natural light would be expected, namely bedrooms, living rooms, Kitchens and combined living/kitchen areas (L/K Spaces). The Proposed Development consists of two residential buildings, namely the Block A, with 4 storeys and 82 rooms, and Block B, with 4 storeys and a total of 65 rooms.
- 5.1.4. The results of the Internal Daylight Assessment of Block A (Table 5-1) indicated that out of a total of 82 rooms, 53 (64.6%) met the minimum recommended ADF criteria and 29 (35.4%) fall below the suggested threshold. When presented separately by room type, out of the 51 Bedrooms assessed, 49 (96.1%) met the BRE criteria and 2 (3.9%) did not; while all 4 Living Spaces in the ground floor met the criteria; and for L/K which fall under the same BRE criteria, non-of the 27 rooms met the criteria. The rooms that met the criteria showed that the ADF is 1% or higher in Bedrooms 1.5% or higher in Living rooms and 2% or higher for Kitchens or Kitchen/Living rooms throughout the scheme.

**Table 5-1 – ADF Results – Block A**

Floor	Type of Rooms Assessed	BRE ADF Target	Number of Rooms Assessed	Above BRE Criteria		Below BRE Criteria	
				Number	%	Number	%
1	Bedroom	1	17	16	94.1	1	5.9
	Living Room	1.5	4	4	100	0	0
	Kitchen	2	4	0	0	4	100
	Living / Kitchen	2	2	0	0	2	100
2	Bedroom	1	13	13	100	0	0
	Living / Kitchen	2	7	0	0	7	100
3	Bedroom	1	13	13	100	0	0
	Living / Kitchen	2	7	0	0	7	100
4	Bedroom	1	8	7	87.5	1	12.5
	Living / Kitchen	2	7	0	0.0	7	100
<b>TOTAL</b>			<b>82</b>	<b>53</b>	<b>64.6</b>	<b>29</b>	<b>35.4</b>

5.1.5. The results of the Internal Daylight Assessment of Block B (Table 5-2) indicated that out of a total of 65 rooms, 46 (70.8%) met the minimum recommended ADF criteria and 19 (29.2%) fall below the suggested threshold. When presented separately by room type, out of the 38 Bedrooms assessed, 37 (97.4%) met the BRE criteria and only 1 bedroom (2.6%) did not; while out of the 4 Living Spaces assessed, 3 (75%) met the criteria and 1 (25%) did not; and out of 23 L/K and kitchens, 6 (26.1%) met the BRE criteria and 17 (73.9%) did not. The rooms that met the criteria showed that the ADF is 1% or higher in Bedrooms 1.5% or higher in Living rooms and 2% or higher for Kitchens or Kitchen/Living rooms throughout the scheme.

**Table 5-2 – ADF Results – Block B**

Floor	Type of Rooms Assessed	BRE ADF Target	Number of Rooms Assessed	Above BRE Criteria		Below BRE Criteria	
				Number	%	Number	%
1	Bedroom	1	9	9	100	0	0
	Living Room	1.5	4	3	75	1	25.0
	Kitchen	2	3	1	33.3	2	66.7
	Living, Kitchen, Dining	2	2	1	50	1	50.0
2	Bedroom	1	10	10	100	0	0
	Living, Kitchen, Dining	2	6	1	16.7	5	83.3
3	Bedroom	1	10	10	100	0	0
	Living, Kitchen, Dining	2	6	1	16.7	5	83.3
4	Bedroom	1	9	8	88.9	1	11.1
	Living, Kitchen, Dining	2	6	2	33.3	4	66.7
<b>TOTAL</b>			<b>65</b>	<b>46</b>	<b>70.8</b>	<b>19</b>	<b>29.2</b>

Figure 5-1 –Results Of Rooms With ADF Below BRE Criteria – Block-A and Block-B

Ground Floor

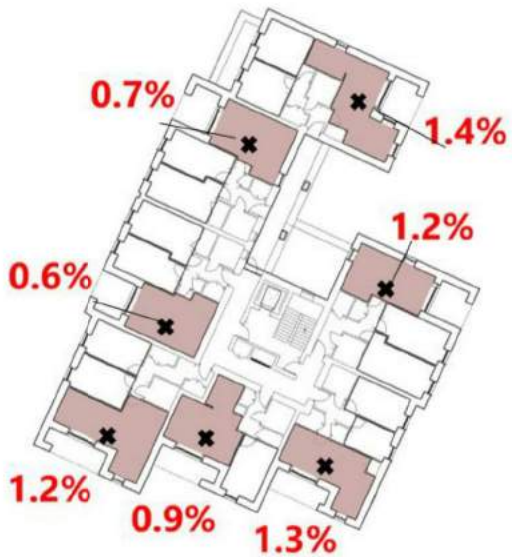


Block-A



Block-B

1<sup>st</sup> Floor

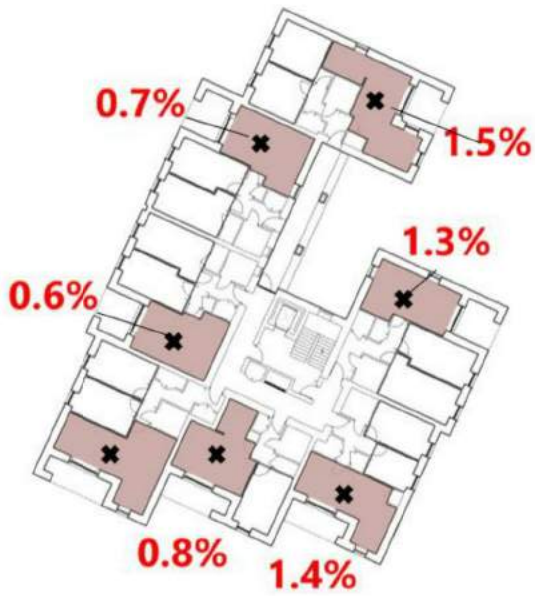


Block-A

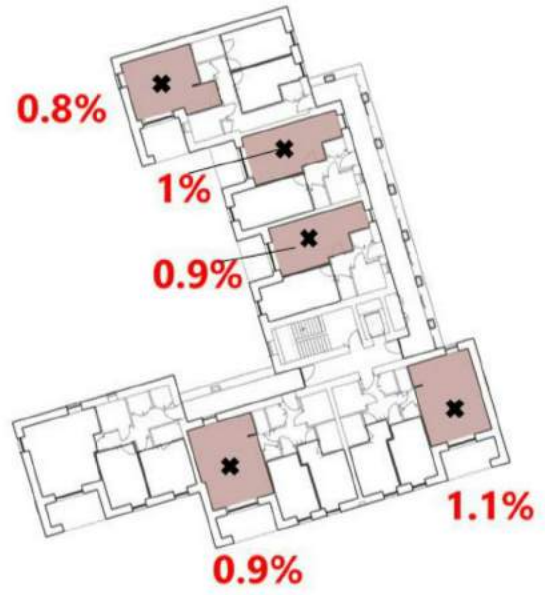


Block-B

**2<sup>nd</sup> Floor**

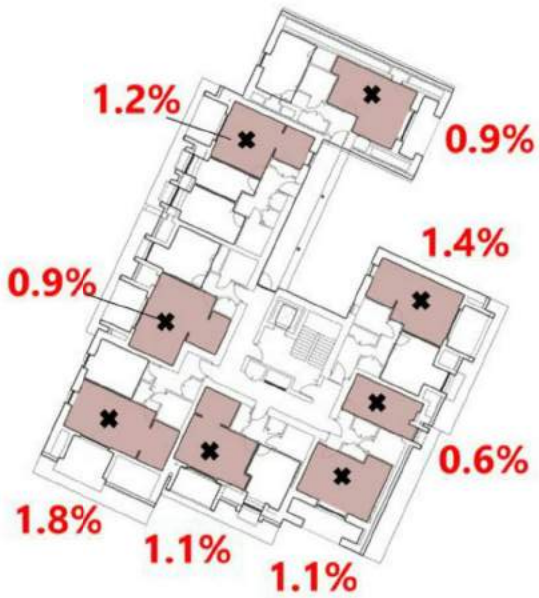


**Block-A**



**Block-B**

**3<sup>rd</sup> Floor**



**Block-A**



**Block-B**

## INTERNAL SUNLIGHT ASSESSMENT

- 5.1.6. Access to sunlight was assessed for the windows of habitable rooms/ living spaces (living rooms, kitchens and dining rooms) and therefore, a total of 31 Living Spaces were tested in the Internal Sunlight Assessment of Block-A from which 27 are 90° due south. In the case of the Block-B, 27 were tested, from which 25 face 90° due south. The results of both buildings are summarised below in Tables 5-3 and 5-4.
- 5.1.7. The results of Block-A indicated that out of 27 Living spaces 90° due south, 12 (44.4%) met the BRE criteria. while the remaining 15 (55.6%) did not.
- 5.1.8. The results of the Block B Building showed that out of 25 Living spaces which are 90° due south, 11 (44%) achieved the recommended APSH and WPSH values, while the remaining 14 (56%) did not.
- 5.1.9. This is due mainly to the self-shading effect caused by the units.

**Table 5-3 –Probable Sunlight Hours Results for the Living spaces – Block-A Building**

Floor No.	Room Orientation	Number of Rooms Assessed	Above BRE Criteria		Below BRE Criteria	
			Number	%	Number	%
1	All Units	10	7	70	3	30
	Units 90° due South	9	7	77.8	2	22.2
2	All Units	7	2	28.6	5	71.4
	Units 90° due South	6	2	33.3	4	66.7
3	All Units	7	3	42.9	4	57.1
	Units 90° due South	6	3	50.0	3	50
4	All Units	7	0	0	7	100
	Units 90° due South	6	0	0	6	100
ALL FLOORS	All Units	31	12	38.7	19	61.3
	Units 90° due South	27	12	44.4	15	55.6

**Table 5-4 –Probable Sunlight Hours Results for the Living spaces – Block-B Building**

Floor No.	Room Orientation	Number of Rooms Assessed	Above BRE Criteria		Below BRE Criteria	
			Number	%	Number	%
Mezzanine	All Units	9	4	44.4	5	55.6
	Units 90° due South	7	3	42.9	4	57.1
1	All Units	6	2	33.3	4	66.7
	Units 90° due South	6	2	33.3	4	66.7
2	All Units	6	2	33.3	4	66.7
	Units 90° due South	6	2	33.3	4	66.7
3	All Units	6	4	66.7	2	33.3
	Units 90° due South	6	4	66.7	2	33.3
4	All Units	9	4	44.4	5	55.6
	Units 90° due South	7	3	42.9	4	57.1
ALL FLOORS	All Units	27	12	44.4	15	55.6
	Units 90° due South	25	11	44.0	14	56.0

## OVERSHADOWING ASSESSMENT OF AMENITY SPACES WITHIN THE PROPOSED DEVELOPMENT

- 5.1.10. In line with the BRE Guide, the Overshadowing Assessment on the amenity spaces within the Proposed Development scheme seeks to identify the spaces for which at least half their area receives at least two hours of sunlight on 21<sup>st</sup> March. Figures 5-2 and 5-3 provide a graphical representation of the Overshadowing analysis within the Site and Table 5-5, the detailed results.
- 5.1.11. The results indicated that 27 out of 40 ground floor green open spaces, private gardens and terraces satisfied the BRE criteria, which represents 68% of the total spaces assessed.
- 5.1.12. The spaces that did not meet the criteria represent only 33% of the total assessed (13 amenity spaces) and are Receptors 8, 9, 10, 11, 12, 13, 15, 16, 24, 25, 26, 27 and 28. These spaces receive less than two hours of sunlight on most of their area on the 21st of March and are either north oriented and/or subject to the shading effects from the Proposed Development. However, while some terraces within Blocks A and B and some rear gardens within Plot H fail to reach the criteria, the assessment showed that for Blocks A and B, both communal amenity spaces (Receptors 1 and 22) met the criteria, and so did all front gardens of Plot H (Receptors 36 to 40).

Figure 5-2 - Sun Hours on Ground – 21st March Results Proposed Development





Figure 5-3 - Sun Exposure – BRE Results Proposed Development



Table 5-5 – Overshadowing Results – Proposed Amenity Spaces

Receptor	No.	Proposed (%)	Above BRE Criteria?
South Planting and Communal Amenity	1	86.41	Yes
West Lawn and Planting	2	82.98	Yes
Plot A002 GF Terrace	3	100	Yes
Plot A003 GF Terrace	4	100	Yes
Plot A004 GF Terrace	5	100	Yes
Plot A005 West GF Terrace	6	100	Yes
Plot A006 West GF Terrace	7	81.27	Yes
Plot A006 East GF Terrace	8	7.86	No
Plot A005 East GF Terrace	9	0	No
Plot A001 GF Terrace	10	0	No
Plot B001 GF Terrace	11	0.32	No



Plot B004 West GF Terrace	12	0	No
Plot B005 West GF Terrace	13	1.22	No
Plot B006 West GF Terrace	14	74.84	Yes
Plot B006 East GF Terrace	15	0	No
Plot B005 East GF Terrace	16	4.73	No
Plot B004 East GF Terrace	17	100	Yes
Plot B003 GF Terrace	18	64.5	Yes
Plot B002 GF Terrace	19	57.23	Yes
South Planting	20	100	Yes
South Planting	21	100	Yes
Central Communal Amenity	22	58.66	Yes
North Planting	23	69.24	Yes
East Planting	24	47.71	No
Plot H01 Private Garden	25	27.01	No
Plot H02 Private Garden	26	33.62	No
Plot H03 Private Garden	27	39.25	No
Plot H04 Private Garden	28	44.12	No
Plot H05 Private Garden	29	50.85	Yes
Plot H06 Private Garden	30	56.28	Yes
Plot H07 Private Garden	31	62.17	Yes
Plot H08 Private Garden	32	62.89	Yes
Plot H09 Private Garden	33	85.16	Yes
Plot H10 Private Garden	34	67.37	Yes
East Planting	35	84.69	Yes
Plots H09-10 Front Garden	36	74.78	Yes
Plots H07-08 Front Garden	37	100	Yes
Plots H05-06 Front Garden	38	100	Yes
Plots H03-04 Front Garden	39	99.03	Yes
Plots H01-02 Front Garden	40	88.22	Yes

## 6. MITIGATION

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- 6.1.1. The daylight assessment identified a number of rooms where the ADF is below the recommended level. It is therefore recommended that mitigation measures are introduced where possible in order to improve daylight conditions.
- 6.1.2. The provision of natural light within the rooms of the proposed scheme has been an integral part of the design development process aiming to provide the highest daylight possible considering the constraints of the Site and the effects on other aspects such as energy and overheating.
- 6.1.3. The following mitigation measures were incorporated within the design to improve the daylight within the scheme:
- Increase of the ratio between room and window area by widening windows throughout the scheme
  - Addition of windows to Ground floor in both North and South Living Spaces of Block-B building and to the top floor of the same block on one of the South Living Spaces.
- 6.1.4. After the assessment was completed there have been further modifications to the design and the conclusions should be broadly similar, although with slight localised differences. There is one additional room that may pass BRE criteria on the ground floor located in the southern façade of Block-A. A qualitative review indicates that the final version of the design is likely to improve daylight in some rooms around the entire scheme, while some others may show lower values of ADF.

## 7. CONCLUSIONS

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- 7.1.1. This report presents the results of the Daylight, Sunlight and Overshadowing assessment of the Proposed Development at OCC Sandy Lane in Oxford, as well as its effects on the daylight and sunlight availability to the existing properties adjacent to the site.

### **Impact Assessment on Existing Properties**

- 7.1.2. The impact of the Proposed Development on the levels of daylight and sunlight on the surrounding properties and proposed amenity areas have been assessed using the appropriate parameters and guidance using the BRE Guidelines.
- 7.1.1. The results of the Daylight and Sunlight Impact Assessment indicated that all of the properties around the Site will retain suitable levels of daylight and sunlight after the introduction of the Proposed Development, with a negligible magnitude of change between the Baseline condition and the Proposed scenario.
- 7.1.2. The Overshadowing Assessment results indicated that all of the surrounding open amenity areas will either receive at least two hours of sunlight on half of their area on the 21st of March or retain at least 0.80 of its former value with the introduction of the Proposed Development and therefore, satisfy the BRE recommendation.

### **Proposed Development Assessment**

- 7.1.3. The results of the Internal Daylight Assessment of Block A indicated that out of a total of 82 rooms, 53 (64.6%) met the minimum recommended ADF criteria and 29 (35.4 %) fall below the suggested threshold. The rooms that met the criteria showed that the ADF is 1% or higher in Bedrooms 1.5% or higher in Living rooms and 2% or higher for Kitchens or Kitchen/Living rooms throughout the scheme.



- 7.1.4. The results of the Internal Daylight Assessment of Block B indicated that out of a total of 65 rooms, 46 (70.8%) met the minimum recommended ADF criteria and 19 (29.2%) fall below the suggested threshold. The rooms that met the criteria showed that the ADF is 1% or higher in Bedrooms 1.5% or higher in Living rooms and 2% or higher for Kitchens or Kitchen/Living rooms throughout the scheme.
- 7.1.5. A total of 31 Living Spaces were tested in the Internal Sunlight Assessment of Block-A from which 27 are 90° due south. In the case of the Block-B, 27 were tested, from which 25 face 90° due south.
- 7.1.6. The results of Block A indicated that out of 27 Living spaces 90° due south, 12 (44.4%) met the BRE criteria, while the remaining 15 (55.6%) did not.
- 7.1.7. The results of the Block B Building showed that out of 25 Living spaces which are 90° due south, 11 (44%) achieved the recommended PSH and WPSH values, while the remaining 14 (56%) did not.
- 7.1.8. The provision of natural light within the rooms of the proposed scheme has been an integral part of the design development process in the pursue to provide the highest daylight possible.
- 7.1.9. The daylight assessment identified a number of rooms where the ADF is below the recommended level. It is therefore recommended that further mitigation measures are introduced where possible in order to improve daylight conditions.
- 7.1.10. Mitigation to improve results can include improving the window/floor ratio (i.e. increasing windows or reducing room size).
- 7.1.11. After the assessment was completed there have been further modifications to the design and the conclusions should be broadly similar, although with slight localised differences. There is one additional room that may pass BRE criteria on the ground floor located in the southern façade of Block-A. A qualitative review indicates that the final version of the design is likely to improve daylight in some rooms around the entire scheme, while some others may show lower values of ADF.
- 7.1.12. The results of the overshadowing assessment of the amenity spaces within the Proposed Development showed that 27 out of 40 ground floor green open spaces, private gardens and terraces satisfied the BRE criteria, which represents 68% of the total spaces assessed. The spaces that did not meet the criteria represent 33% of the total assessed (13 amenity spaces) and are either north oriented and/or subject to the shading effects from the Proposed Development. However, while some terraces within Blocks A and B and some rear gardens within Plot H fail to reach the criteria, the assessment showed that for Blocks A and B, both communal amenity spaces met the criteria, and so did all front gardens of Plot H buildings.

## 8. LIMITATIONS AND ASSUMPTIONS

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- 8.1.1. All calculations have been based on best practice guidance and on drawing or models of the Proposed Development provided by the architects. Where required, estimations have been made with regards to the height and massing of surrounding properties, based on available satellite photographs and mapping.
- 8.1.2. Whilst the BRE Guide provides numerical guidelines for daylight, sunlight and overshadowing, the Guide is not an instrument of planning policy, therefore some level of flexibility should be applied where appropriate.

- 8.1.3. This report is intended for the sole benefit of the parties named above, WSP shall not be liable for any use of the report for any reasons other than that for which the report was originally prepared and provided.

## GLOSSARY

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VSC – Vertical Sky Component - A measure of the percentage of skylight incident at a point on a vertical plane in relation to the unobstructed skylight incident on the horizontal plane.

APSH – Annual Probable Sunlight Hours – The total no. of sunlight hours in a year falling on a window or a vertical surface expressed as a percentage of total no. of unobstructed sunlight hours.

WPSH – Winter Probable Sunlight Hours - The total no. of sunlight hours falling on a window or a vertical surface between 21st September and 21st March expressed as a percentage of total no. of unobstructed sunlight hour.

ADF – Average Daylight Factor – It is the ratio of the average indoor illuminance on a working plane to the outdoor illuminance.

CIE – Commission Internationale De L'Eclairage – It is an authority which has developed a number of standard sky distributions (e.g. overcast, uniform) based on very specific mathematical formula.

$\theta$  – Angle of visible sky – It is the angle subtended in the vertical plane normal to the window by sky visible from centre of the window.

L/K – Living/kitchen room space.

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