



Daylight, Sunlight & Overshadowing Assessment:

Tuscany, Oak Glade, Northwood

Juttla Architects

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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.

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1. INTRODUCTION

Hawkins Environmental Limited has been instructed by Juttla Architects to undertake a daylight, sunlight & overshadowing assessment for the redevelopment of Tuscany, a residential property located in the Northwood, London Borough of Hillingdon.

The proposed development will see the demolition of the existing structure and construction of new dwelling. A site location plan can be seen in Appendix 1.

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 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*" by PJ Littlefair. This report summarises an assessment of the impacts of the proposed development on the surrounding properties potential to receive daylight and sunlight.

2. PLANNING POLICY & GUIDANCE

2.1. National Planning Policy Framework (2019)

The National Planning Policy Framework (NPPF) was first published on the 27th March 2012 and revised July 2018 and again on the 20th February 2019. The NPPF outlines the Government's environmental, economic and social policies for England. The NPPF sets out a presumption in favour of sustainable development which should be delivered with three main dimensions: economic; social and environmental (Paragraphs 7, 8 10 and 11). The NPPF aims to enable local people and their councils to produce their own distinctive local and neighbourhood plans, which should be interpreted and applied in order to meet the needs and priorities of their communities.

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 170).

Since the publication of the revised 2018 version of the NPPF (which has been retained in the 2019 version), the NPPF talks specifically about daylight for the first time. Paragraph 123 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 (2015)

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.

2.3. The London Plan (2016)

The London Plan – Spatial Development Strategy for London Consolidated with Alterations since 2011 (2016) provides an overall strategic plan for London, and it sets out a fully integrated economic, environmental, transport and social framework for the development of the capital to 2031. The London Plan brings together the Mayor's strategies, including policy on a range of environmental issues, such as climate change, air quality,

noise and waste. London Boroughs' local plans need to be in general conformity with the London Plan, and its policies guide decisions on planning applications by councils and the Mayor.

Policy 3.5 relates to the quality and design of housing developments and states that:

"Housing developments should be of the highest quality internally, externally and in relation to their context and to the wider environment, taking account of strategic policies in this Plan to protect and enhance London's residential environment and attractiveness as a place to live."

Policy 7.6Bd goes on to state that:

"Buildings and structures should... not cause unacceptable harm to the amenity of surrounding land and buildings, particularly residential buildings, in relation to privacy, overshadowing, wind and microclimate. This is particularly important for tall buildings".

2.4. The New London Plan (2019 – Draft)

The New London Plan takes an even tougher approach to air quality and when adopted, will replace the existing London Plan. The Examination in Public (EiP) on the London Plan was held between 15th January and 22nd May 2019. The Panel of Inspectors appointed by the Secretary of State issued their report and recommendations to the Mayor on 8th October 2019. The Mayor has considered the Inspectors' recommendations and, on the 9th December 2019, issued to the Secretary of State his intention to publish the London Plan along with a clean and tracked version of the Intend to Publish London Plan, a statement of reasons for any of the Inspectors' recommendations that the Mayor does not wish to accept and a note that sets out a range of interventions that will help achieve the housing delivery set out in the Plan. The SoS published a response to the Intend to Publish version on 13th March 2020, which outlined that the draft London Plan requires amendments to be carried out. Nevertheless, given the very advanced stage that the draft London Plan has reached, the draft policies carry significant weight.

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".

2.5. 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”.

2.6. Site Layout Planning for Daylight and Sunlight (2011)

The Building Research Establishment (BRE) report, "Site layout planning for daylight and sunlight" Second Edition 2011 by PJ Littlefair (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.

3. ASSESSMENT METHODOLOGY

3.1. Methodology Overview

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.

A three-dimensional computer model has been constructed using site survey information for the surrounding buildings. For each potentially affected window, the VSC and APSH have been calculated using the software packages created by MBS Survey Software Limited to create both Waldram Diagrams which plot VSC, as well as the Sunlight Availability Indicators which plot APSH. The tools created by MBS are one of the only tools in the Daylight/Sunlight sector that fully incorporate the methodologies introduced in the BRE Guidance and are widely acknowledged to be a suitable tool for undertaking daylight, sunlight and overshadowing assessments in accordance with the BRE Guidance.

The three-dimensional computer model can also be used to plot transient overshadowing. The BRE Guidance stipulates the Spring Equinox on the 21st March as the control date; however, the winter and summer solstices on the 21st December and 21st June are also commonly plotted.

It is important to note that according to the BRE Report, calculations normally do not take into account vegetation. The exception is when evergreen vegetation exists that forms a continuous barrier.

3.2. 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.

3.3. Methodology for Determining Impacts

To determine the impact of the proposed development, the VSC, APSH and shadow diagrams are plotted with the proposed development in place based on the three-dimensional computer model of the proposed development and the software packages created by MBS Survey Software Limited.

3.3.1. Daylight

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.

3.3.2. Sunlight

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.

3.3.3. Overshadowing

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.

3.4. 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 I 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, <u>and</u> one or more of the scenarios to describe a Minor Adverse Impact applies, <u>and</u> 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 I of the BRE Guidance

4. ASSESSMENT OF IMPACTS

This section summarises the impact of the proposed development on levels of daylight and sunlight on surrounding windows.

4.1. Identification of Receptors

Based on a site visit on the 15th September 2020, and also based on the plans of the development, a number of windows that could be affected have been identified. The properties of concern can be seen in the site plan in Appendix 1. The windows under consideration can be seen in Appendix 2.

The main properties of concern are 'Cobwebs' and 'Squirrel's Nook', residential properties situated on adjacent plots.

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. Figures 4.1 to Figure 4.10 show the three-dimensional model of the development, with and without the proposed development.

At this site, Hawkins Environmental were provided with a site survey of the existing site layout and plans and elevations of the proposed development. In addition, information collected from planning records have been used, in connection with Ordnance Survey information (including Lidar data in relation to building heights) to construct the three-dimensional computer model. Wherever possible, survey information provided by the client and their agents have 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.

Figure 4.1: 3D model of the existing site layout from the North

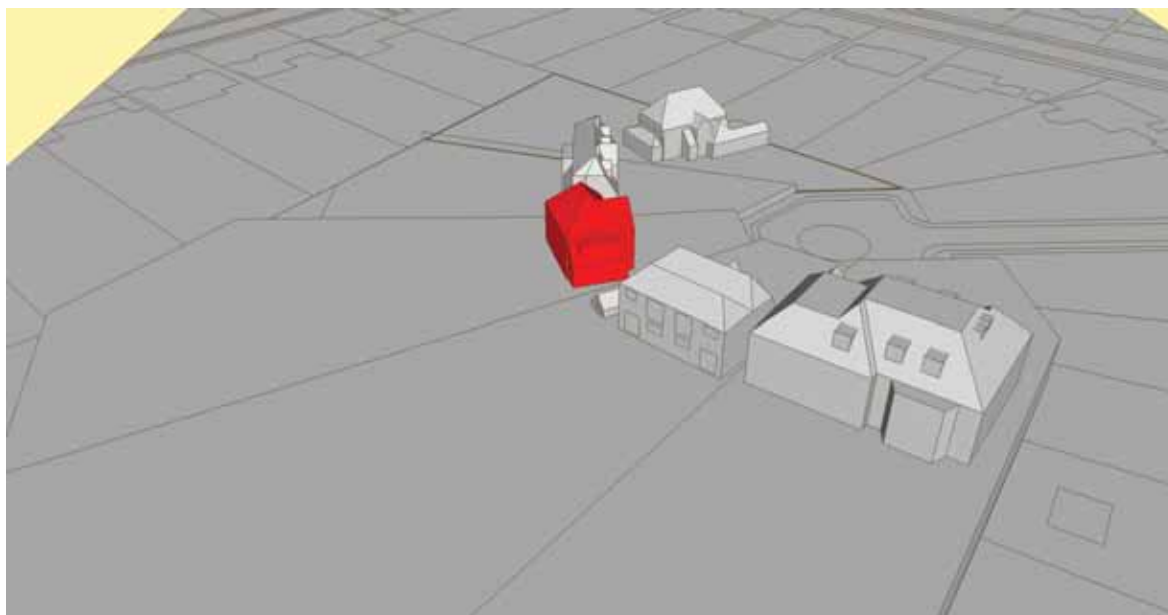


Figure 4.2: 3D model of the proposed development from the North



Figure 4.3: 3D model of the existing site layout from the East

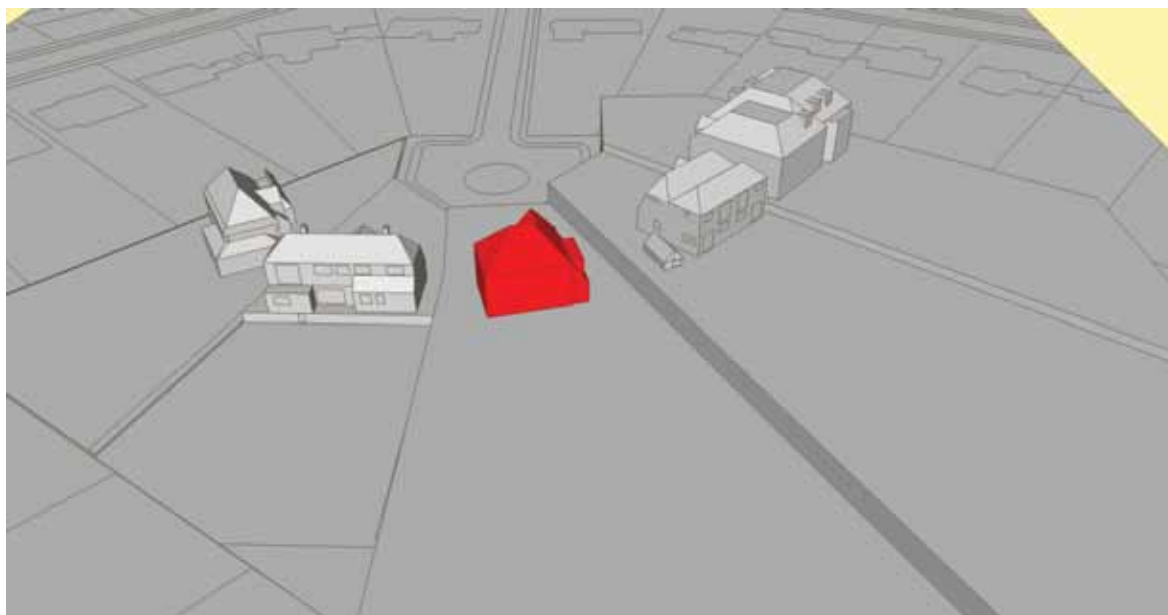


Figure 4.4: 3D model of the proposed development from the East



Figure 4.5: 3D model of the existing site layout from the South

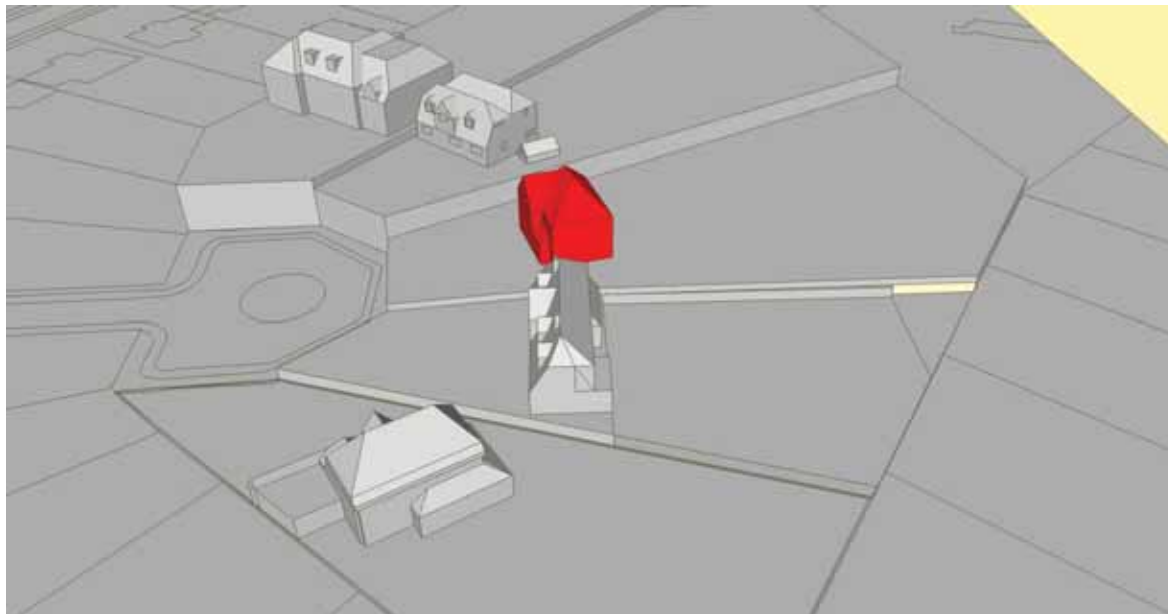


Figure 4.6: 3D model of the proposed development from the South



Figure 4.7: 3D model of the existing site layout from the West

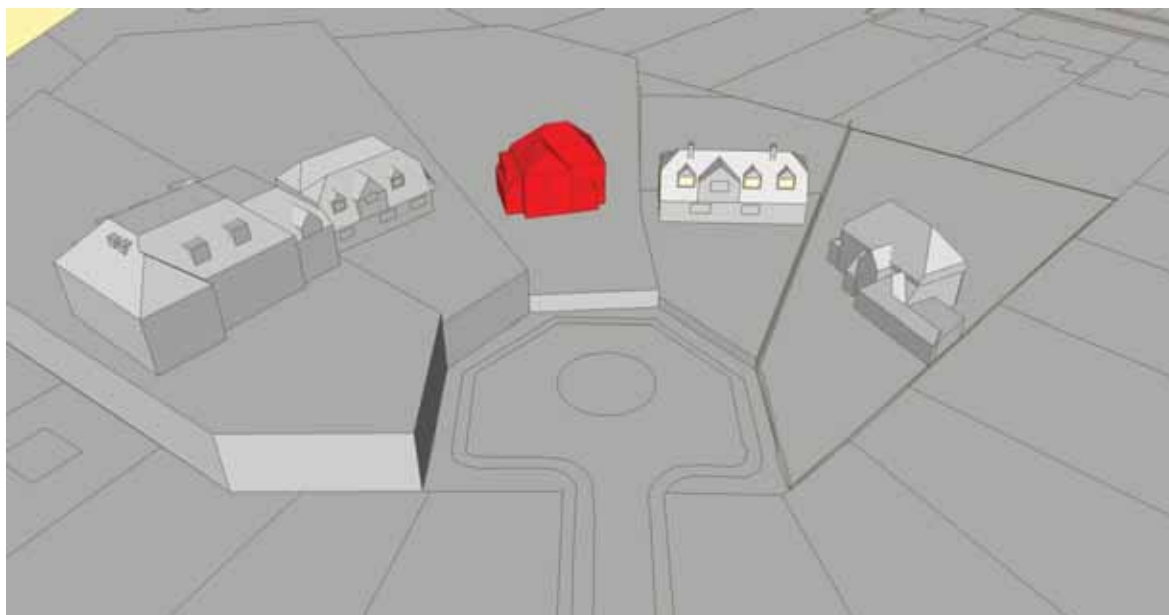


Figure 4.8: 3D model of the proposed development from the West

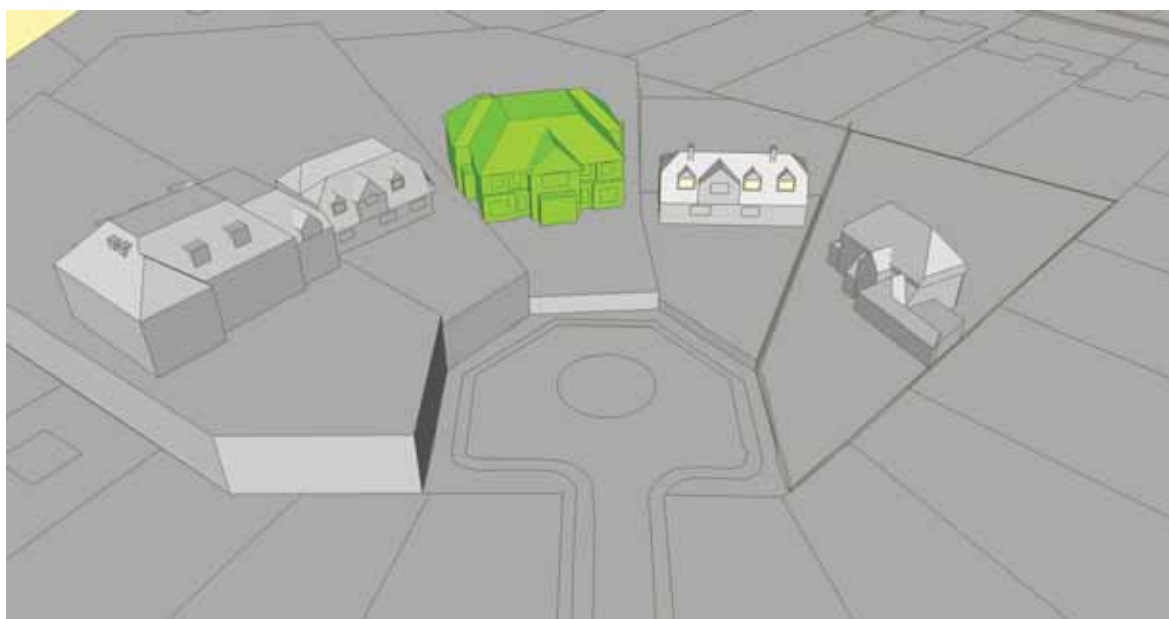


Figure 4.9: 3D model of the existing site layout from Overhead

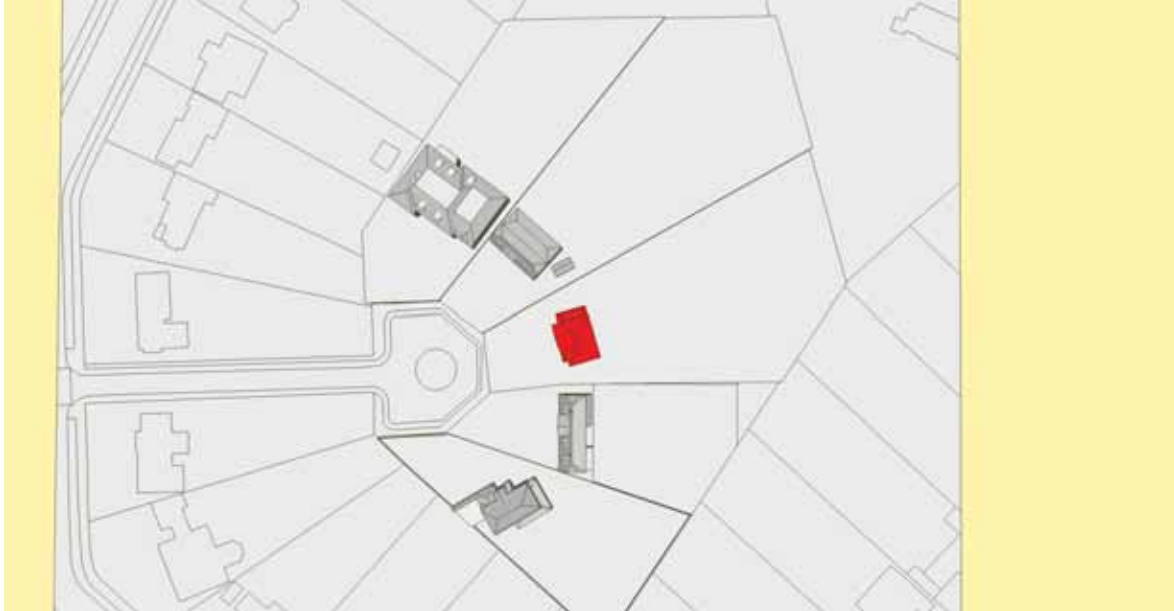
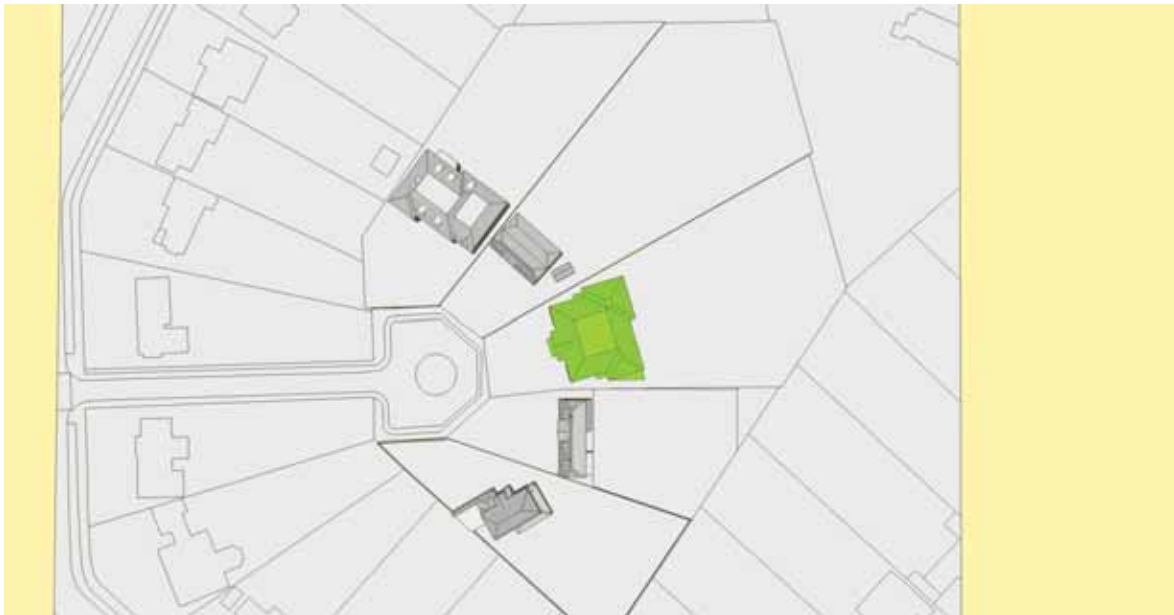


Figure 4.10: 3D model of the proposed development from Overhead



4.3. Daylight Assessment

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. The results can be found in Table 4.1, with the Waldram Diagrams replicated in Appendix 3.

The results show that at all bar one of the affected windows, whilst there is a very small reduction in daylight to some, the proposed level of daylight will either exceed 27% VSC, or where it does not exceed 27% VSC, the proposed level of daylight would be greater than 0.8 times the existing. Therefore, the reduction in daylight at these windows is unlikely to be noticeable and therefore under the guidance contained within Appendix I of the BRE Report and replicated in Table 3.1 of this report, the impact of the proposed development on levels of daylight is considered to be “negligible”.

The exception to the above is a single window at ‘Cobwebs’ (Window ID 6), where it can be seen from Table 4.1 does not fully achieve the guidance contained within the BRE Report, as they it 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.

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, this window has been considered individually to assess their likely significance:

- We note that window ID 6 is one of at least two windows which we understand serves the same room and this window does not appear to be the main window to the room. The main window (Window ID 7) faces outwards to the front garden and will remain unaffected by the proposed development. Consequently, the room will remain well lit and therefore, the loss of daylight to this room is unlikely to be noticeable.

Table 4.1: Daylight Impact Assessment

Window Ref	Window ID	Vertical Sky Component %			Meets BRE Guide?	Window Orientation
		Existing	Proposed	Ratio*		
Cobwebs – Lower Ground Floor 1	1	38.98	38.21	0.98	YES	90°N
Cobwebs – Ground Floor 1	2	39.52	39.04	0.99	YES	90°N
Cobwebs – Ground Floor 2	3	35.77	34.98	0.98	YES	90°N
Cobwebs – Ground Floor 3	4	39.43	37.41	0.95	YES	90°N
Cobwebs – Ground Floor 4	5	39.39	36.73	0.93	YES	90°N
Cobwebs – Ground Floor 5	6	27.73	20.48	0.74	NO	0°N
Cobwebs – Ground Floor 6	7	37.70	37.70	1.00	YES	270°
Cobwebs – Ground Floor 7	8	37.27	37.26	1.00	YES	270°
Cobwebs – First Floor 1	9	39.60	39.16	0.99	YES	90°N
Cobwebs – First Floor 2	10	39.59	38.96	0.98	YES	90°N
Cobwebs – First Floor 3	11	39.58	38.72	0.98	YES	90°N
Cobwebs – First Floor 4	12	39.56	38.38	0.97	YES	90°N
Cobwebs – First Floor 5	13	39.48	37.34	0.95	YES	90°N

Window Ref	Window ID	Vertical Sky Component %			Meets BRE Guide?	Window Orientation
		Existing	Proposed	Ratio*		
Cobwebs – First Floor 6	14	37.83	37.81	1.00	YES	270°
Cobwebs – First Floor 7	15	38.76	38.75	1.00	YES	270°
Cobwebs – First Floor 8	16	38.12	38.12	1.00	YES	270°
Cobwebs – First Floor 9	17	38.62	38.62	1.00	YES	270°
Squirrels Nook – Ground Floor 1	18	39.50	37.13	0.94	YES	61°N
Squirrels Nook – Ground Floor 2	19	36.64	31.99	0.87	YES	132°
Squirrels Nook – Ground Floor 3	20	36.34	33.00	0.91	YES	132°
Squirrels Nook – Ground Floor 4	21	37.15	33.31	0.90	YES	132°
Squirrels Nook – Ground Floor 5	22	39.60	39.45	1.00	YES	42°N
Squirrels Nook – Ground Floor 6	23	39.60	39.53	1.00	YES	42°N
Squirrels Nook – Ground Floor 7	24	39.59	39.55	1.00	YES	42°N
Squirrels Nook – Ground Floor 8	25	39.58	39.54	1.00	YES	42°N
Squirrels Nook – Ground Floor 9	26	34.39	34.34	1.00	YES	222°

Window Ref	Window ID	Vertical Sky Component %			Meets BRE Guide?	Window Orientation
		Existing	Proposed	Ratio*		
Squirrels Nook – Ground Floor 10	27	38.53	38.45	1.00	YES	222°
Squirrels Nook – Ground Floor 11	28	38.83	38.69	1.00	YES	222°
Squirrels Nook – First Floor 1	29	39.46	37.56	0.95	YES	132°
Squirrels Nook – First Floor 2	30	39.52	37.78	0.96	YES	132°
Squirrels Nook – First Floor 3	31	39.61	39.60	1.00	YES	42°N
Squirrels Nook – First Floor 4	32	39.61	39.59	1.00	YES	42°N
Squirrels Nook – First Floor 5	33	39.60	39.59	1.00	YES	42°N
Squirrels Nook – First Floor 6	34	39.60	39.59	1.00	YES	42°N
Squirrels Nook – First Floor 7	35	35.92	35.92	1.00	YES	222°
Squirrels Nook – First Floor 8	36	38.89	38.84	1.00	YES	222°
Squirrels Nook – First Floor 9	37	39.11	39.02	1.00	YES	222°

*= Ratio of proposed levels compared to existing levels

4.4. Sunlight Assessment

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 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.

Table 4.2 details the results of the Annual Probable Sunlight Hours (APSH) calculations for the windows under consideration, with the Sunlight Indicator Diagrams, replicated in Appendix 4.

It can be seen from Table 4.2 that all windows meet the recommendations contained within the BRE Guidance. Therefore, any impact on sunlight at any of the windows with the development in place will be considered “negligible”.

Table 4.2: Sunlight Impact Assessment

Window Ref	ID	Annual Probable Sunlight Hours %				Winter Probable Sunlight Hours %			
		Existing	Proposed	Ratio*	Meets BRE Guide?	Existing	Proposed	Ratio*	Meets BRE Guide?
Cobwebs – Lower Ground Floor 1	1	Sunlight Assessment Not Required (not within 90° of due south)							
Cobwebs – Ground Floor 1	2	Sunlight Assessment Not Required (not within 90° of due south)							
Cobwebs – Ground Floor 2	3	Sunlight Assessment Not Required (not within 90° of due south)							
Cobwebs – Ground Floor 3	4	Sunlight Assessment Not Required (not within 90° of due south)							
Cobwebs – Ground Floor 4	5	Sunlight Assessment Not Required (not within 90° of due south)							
Cobwebs – Ground Floor 5	6	Sunlight Assessment Not Required (not within 90° of due south)							
Cobwebs – Ground Floor 6	7	50	50	1	YES	15	15	1	YES
Cobwebs – Ground Floor 7	8	48	48	1	YES	13	13	1	YES
Cobwebs – First Floor 1	9	Sunlight Assessment Not Required (not within 90° of due south)							
Cobwebs – First Floor 2	10	Sunlight Assessment Not Required (not within 90° of due south)							
Cobwebs – First Floor 3	11	Sunlight Assessment Not Required (not within 90° of due south)							
Cobwebs – First Floor 4	12	Sunlight Assessment Not Required (not within 90° of due south)							

Window Ref	ID	Annual Probable Sunlight Hours %				Winter Probable Sunlight Hours %			
		Existing	Proposed	Ratio*	Meets BRE Guide?	Existing	Proposed	Ratio*	Meets BRE Guide?
Cobwebs – First Floor 5	13	Sunlight Assessment Not Required (not within 90° of due south)							
Cobwebs – First Floor 6	14	45	45	1	YES	10	10	1	YES
Cobwebs – First Floor 7	15	50	50	1	YES	15	15	1	YES
Cobwebs – First Floor 8	16	50	50	1	YES	15	15	1	YES
Cobwebs – First Floor 9	17	50	50	1	YES	15	15	1	YES
Squirrels Nook – Ground Floor 1	18	Sunlight Assessment Not Required (not within 90° of due south)							
Squirrels Nook – Ground Floor 2	19	72	64	0.89	YES	25	17	0.68	YES
Squirrels Nook – Ground Floor 3	20	71	66	0.93	YES	24	19	0.79	YES
Squirrels Nook – Ground Floor 4	21	72	66	0.92	YES	25	19	0.76	YES
Squirrels Nook – Ground Floor 5	22	Sunlight Assessment Not Required (not within 90° of due south)							
Squirrels Nook – Ground Floor 6	23	Sunlight Assessment Not Required (not within 90° of due south)							
Squirrels Nook – Ground Floor 7	24	Sunlight Assessment Not Required (not within 90° of due south)							
Squirrels Nook – Ground Floor 8	25	Sunlight Assessment Not Required (not within 90° of due south)							

Window Ref	ID	Annual Probable Sunlight Hours %				Winter Probable Sunlight Hours %			
		Existing	Proposed	Ratio*	Meets BRE Guide?	Existing	Proposed	Ratio*	Meets BRE Guide?
Squirrels Nook – Ground Floor 9	26	67	67	1	YES	26	26	1	YES
Squirrels Nook – Ground Floor 10	27	74	74	1	YES	26	26	1	YES
Squirrels Nook – Ground Floor 11	28	74	74	1	YES	26	26	1	YES
Squirrels Nook – First Floor 1	29	72	71	0.99	YES	25	24	0.96	YES
Squirrels Nook – First Floor 2	30	72	71	0.99	YES	25	24	0.96	YES
Squirrels Nook – First Floor 3	31	Sunlight Assessment Not Required (not within 90° of due south)							
Squirrels Nook – First Floor 4	32	Sunlight Assessment Not Required (not within 90° of due south)							
Squirrels Nook – First Floor 5	33	Sunlight Assessment Not Required (not within 90° of due south)							
Squirrels Nook – First Floor 6	34	Sunlight Assessment Not Required (not within 90° of due south)							

*= Ratio of proposed levels compared to existing levels

4.5. Overshadowing Assessment

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. Appendix 5 shows the results of the overshadowing assessment on the 21st of March for the existing and proposed site layout.

The Second Edition of the BRE Report, published in 2011, 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.

Figure 4.11 shows the extent of overshadowing to outdoor amenity space with the existing site layout and Figure 4.12 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. Figure 4.13 shows the areas where additional shading has occurred. On Figure 4.13, the areas marked in red are the areas where additional shading has occurred. Table 4.3 shows the results of the analysis and shows that on the 21st of March, in all of the gardens and outdoor amenity space, there is no significant change in overshadowing. As a consequence, any impact upon this amenity space is considered to be insignificant.

Figure 4.11: Existing Overshadowing of Gardens and Outdoor Amenity Space – 21st March

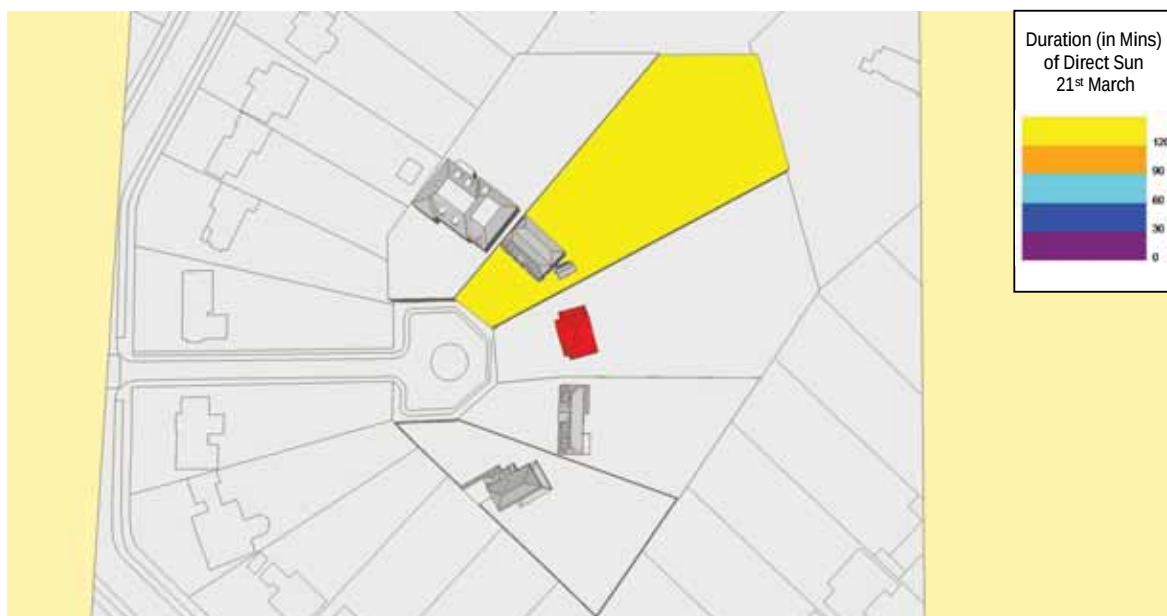


Figure 4.12: Proposed Overshadowing of Gardens and Outdoor Amenity Space – 21st March

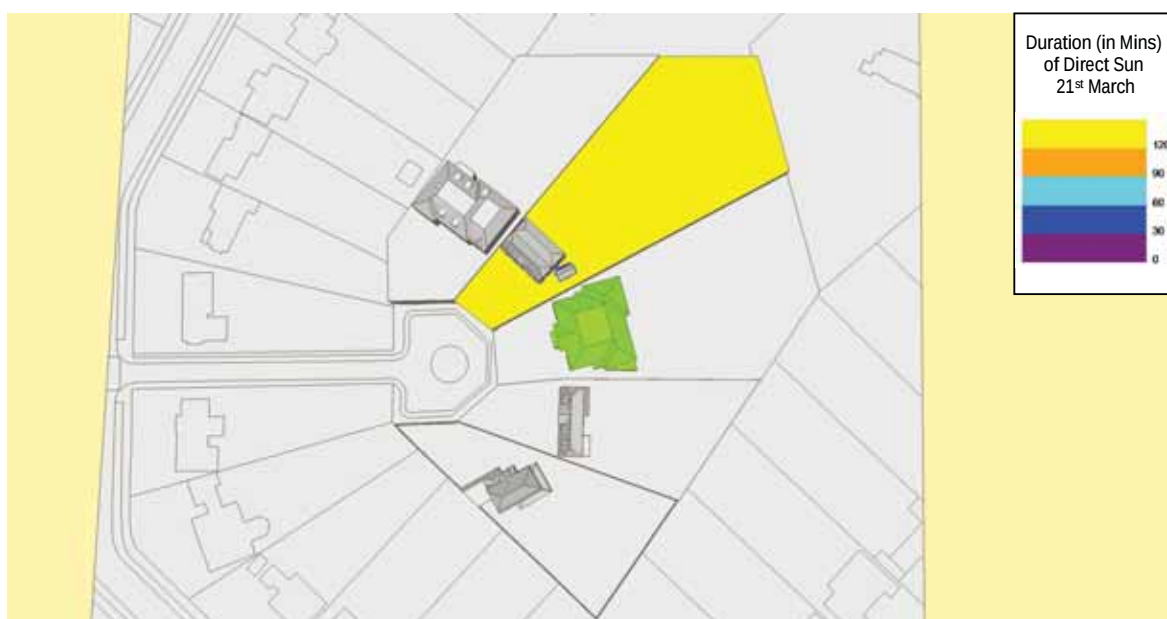


Figure 4.13: Addition Overshadowing of Gardens and Outdoor Amenity Space – 21st March

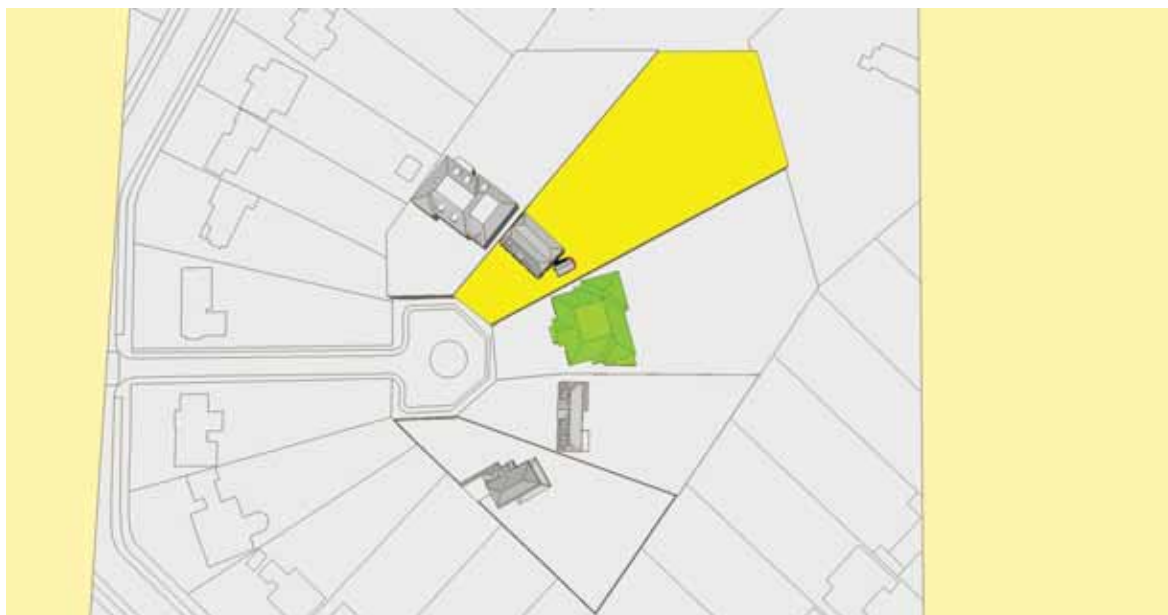


Table 4.3: Results of the Overshadowing Analysis

Receptor	Percentage of the Garden/Outdoor Amenity Space Which Receives Direct Sunlight for at Least Two Hours on the 21 st March			
	Existing	Proposed	Ratio*	Meets BRE Guide?
Cobwebs	94.23	94.16	1.00	YES

*= Ratio of proposed levels compared to existing levels

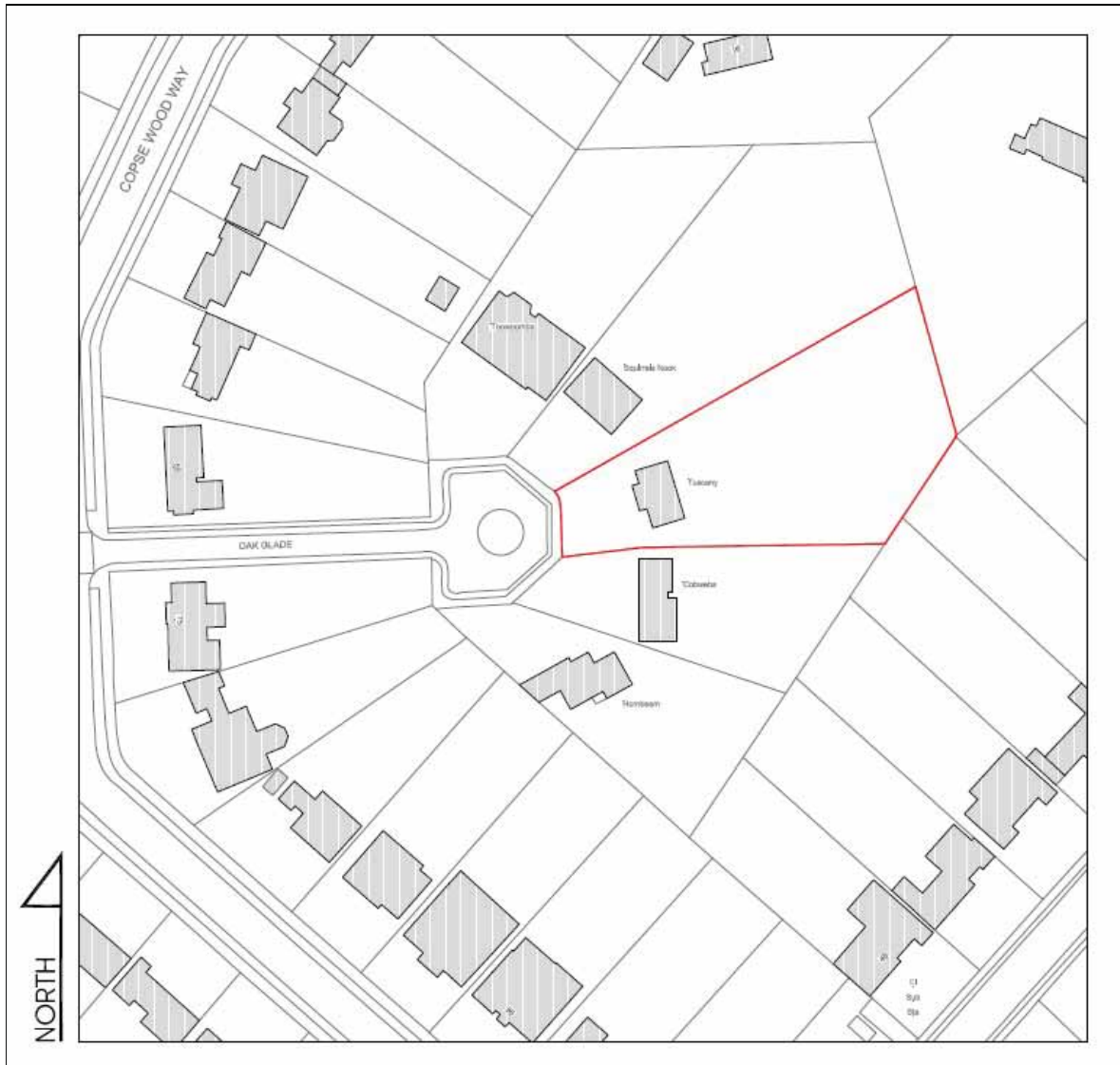
5. CONCLUSIONS

A daylight/sunlight assessment has been carried out in accordance with The Building Research Establishment (BRE) report, "*Site layout planning for daylight and sunlight*" by PJ Littlefair which summarises the impacts of the proposed development at Tuscany, Oak Glade on the surrounding properties potential to receive daylight and sunlight.

The results of the assessment demonstrate that under the guidance contained within Appendix I of the BRE Report, it is considered that the proposed development will have a "*negligible*" impact on the neighbouring dwellings at 'Squirrels Nook' and 'Cobwebs'.

Appendix 1 Site Location Plan

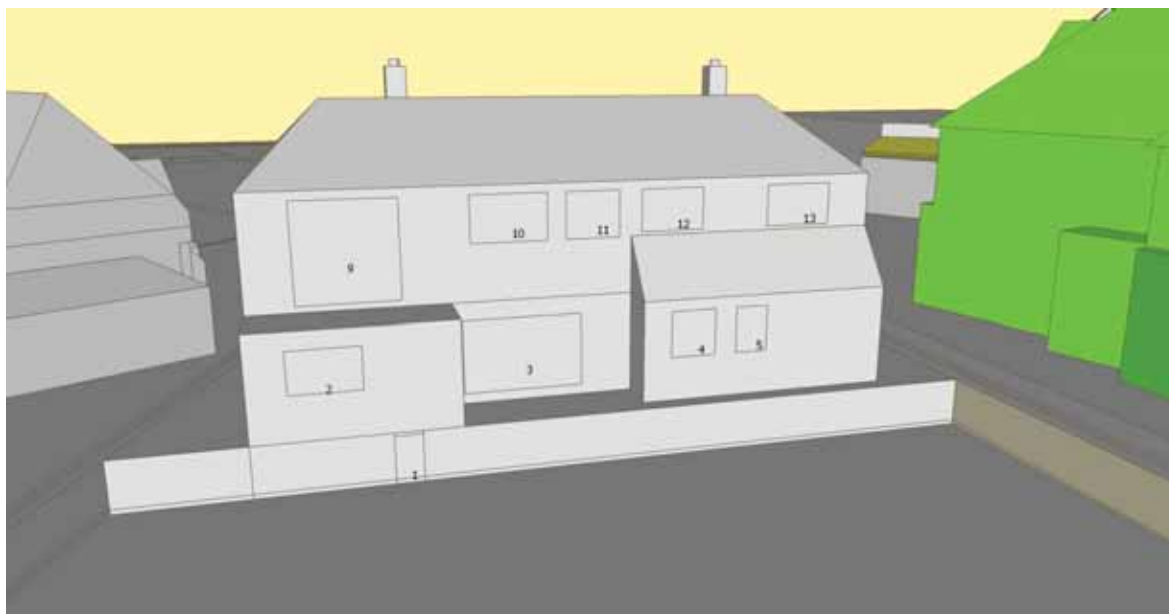
Appendix 1: Site Location Plan



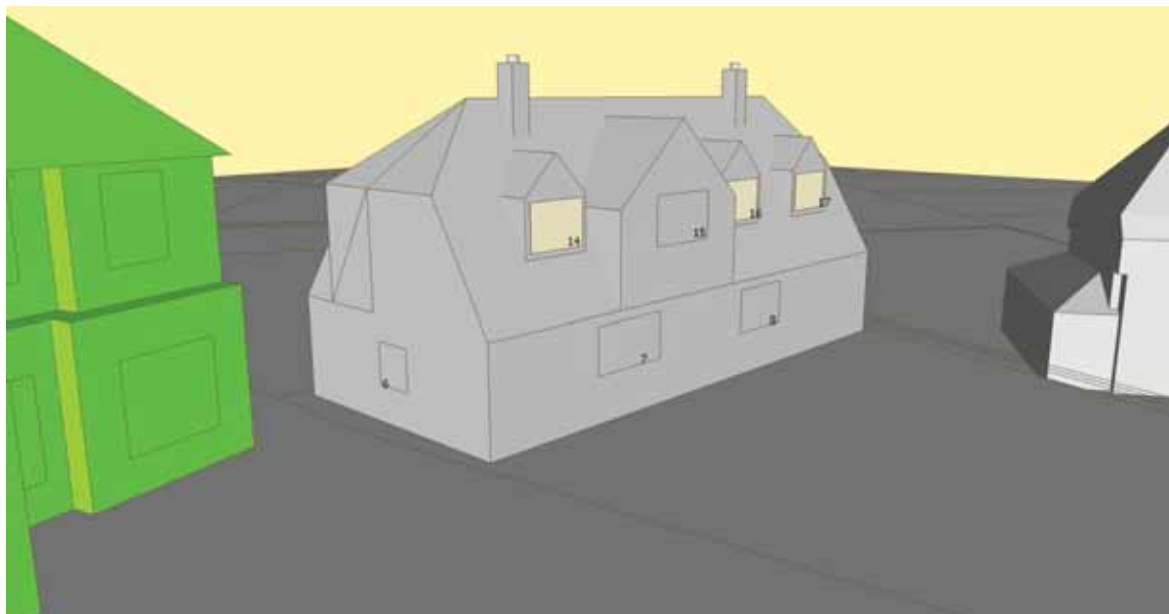
Appendix 2 Window Schedules

Appendix 2: Window Schedules

Cobwebs Rear



Cobwebs Front



Squirrels Nook Rear



Squirrels Nook Front



Appendix 3 Waldram Diagrams

Appendix 3: Waldram Diagrams

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" by PJ Littlefair.

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.

The following pages show a copy of the Waldram Diagrams for each of the affected windows. In the following Waldram Diagrams, the green areas represent the obstructions formed by the proposed development.

It should be noted that the Waldram Diagrams provided here are for information only. The Waldram Diagrams should only be interpreted by professionals with appropriate experience. The full results from these diagrams are provided earlier in the report.

Daylight, Sunlight & Overshadowing Assessment
Tuscany, Oak Glade, Northwood

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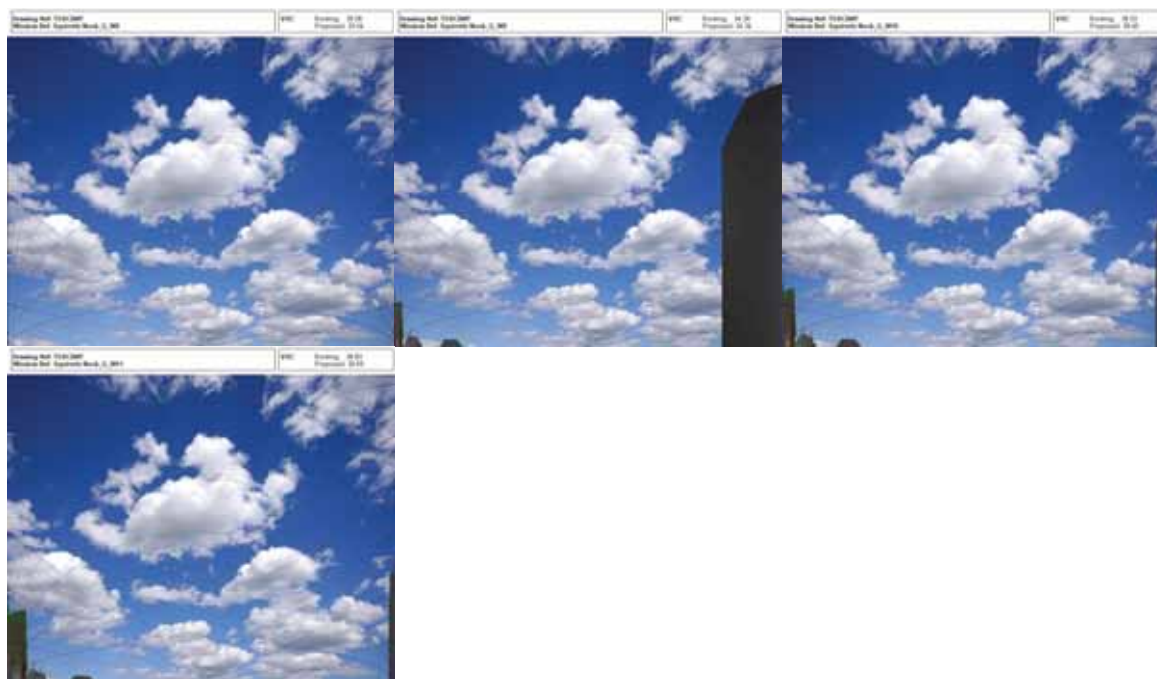
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Daylight, Sunlight & Overshadowing Assessment

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Appendix 4 Sunlight Availability Indicators

Appendix 4: Sunlight Availability Indicators



Daylight, Sunlight & Overshadowing Assessment

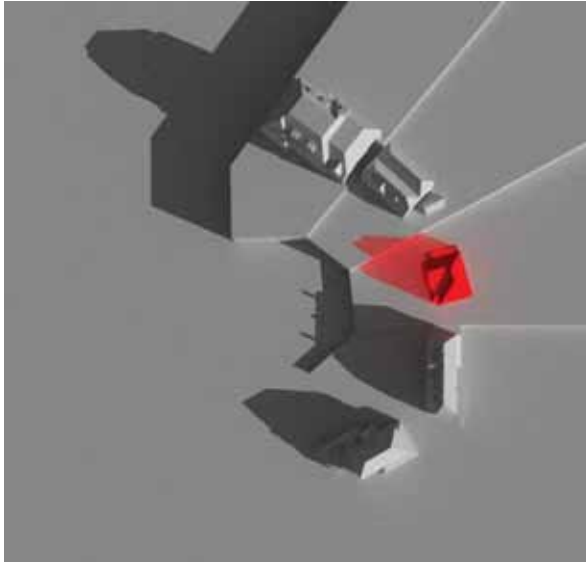
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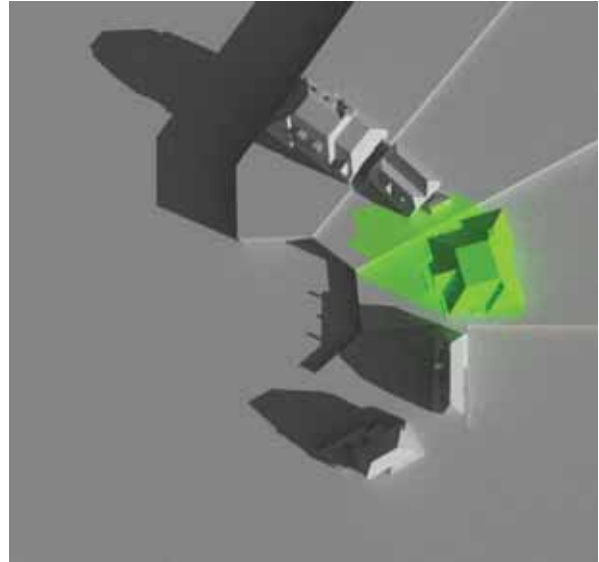
Appendix 5 Shadow Path Diagrams

Appendix 5: Shadow Path Diagrams

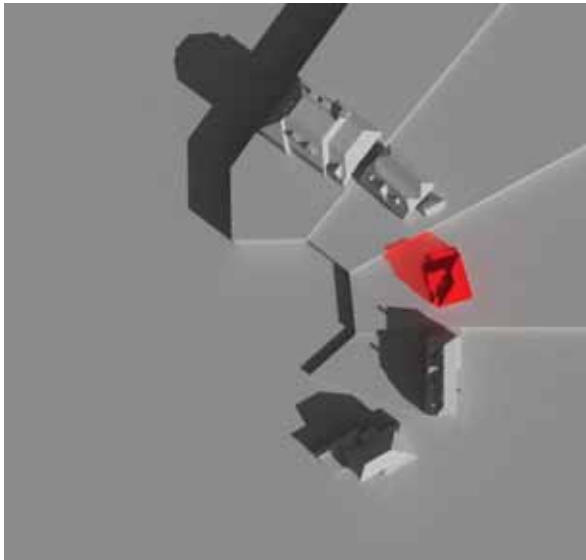
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0800 hrs



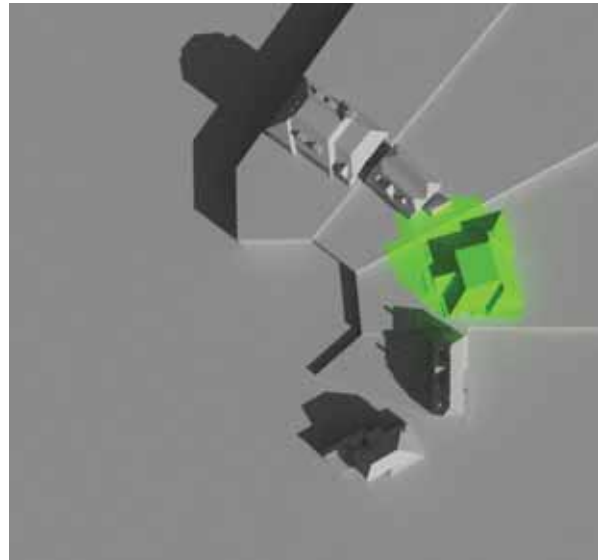
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0800 hrs

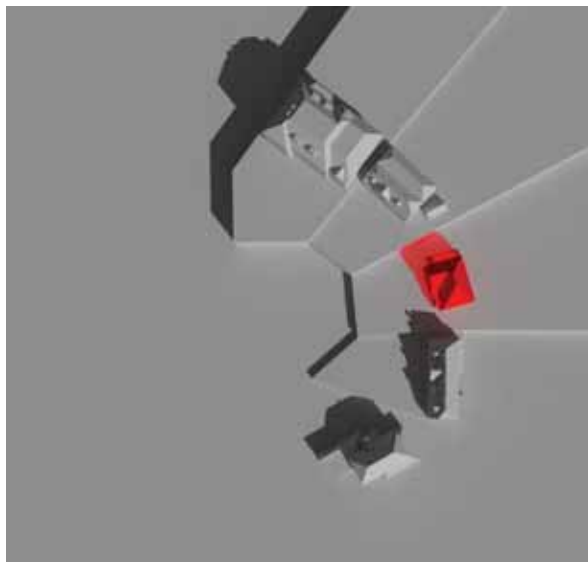
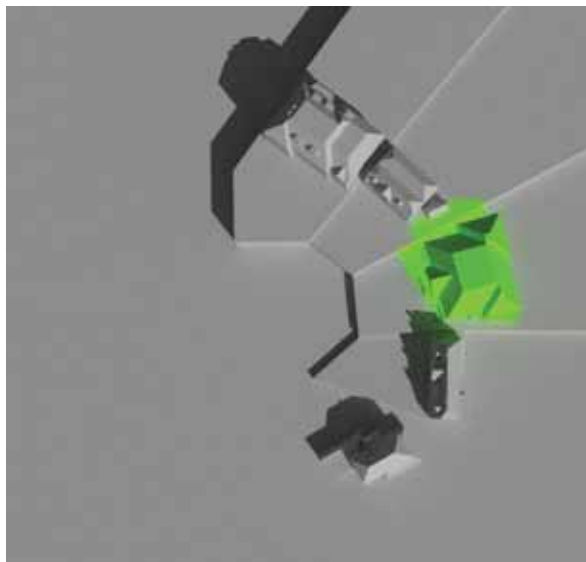
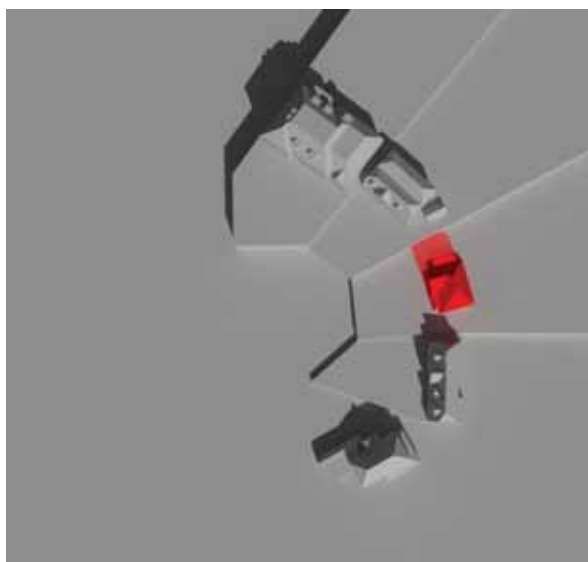
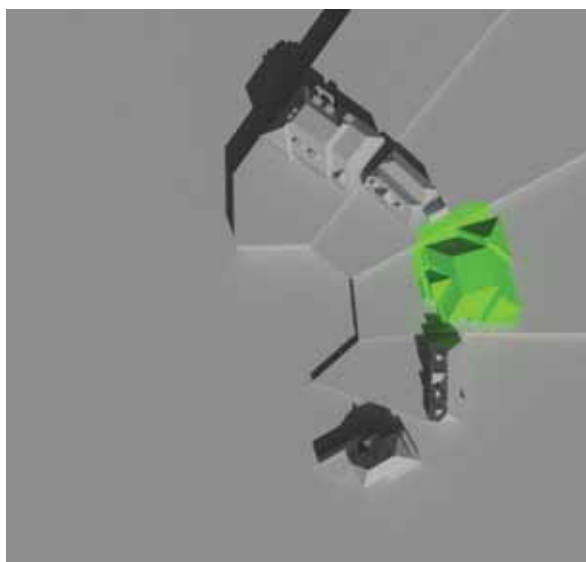


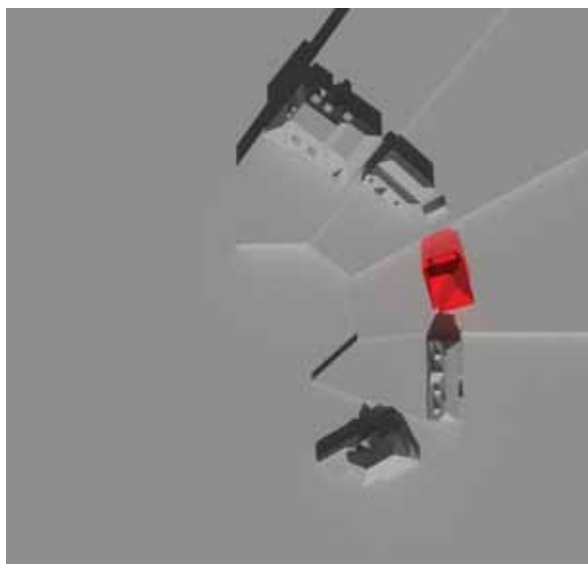
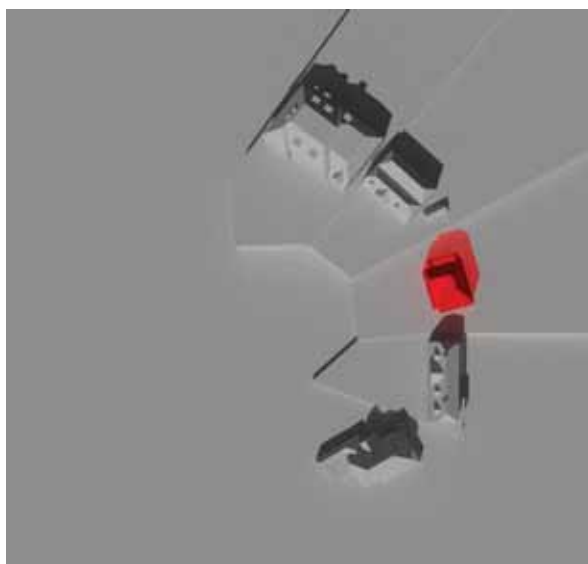
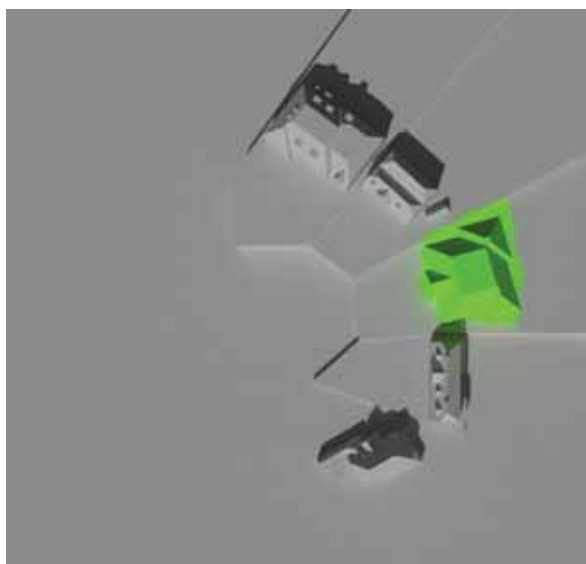
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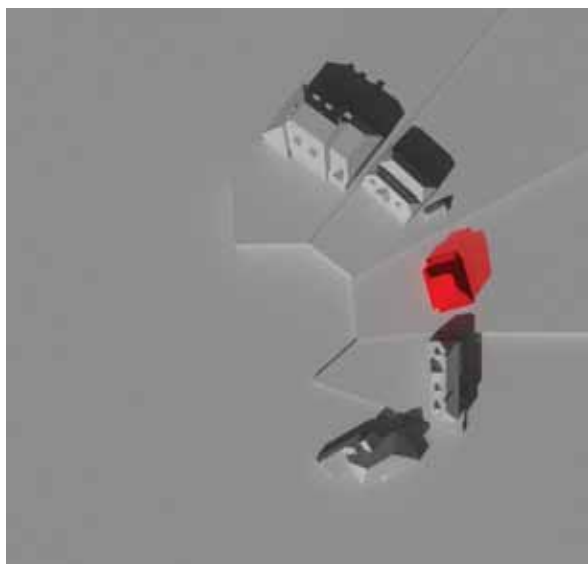
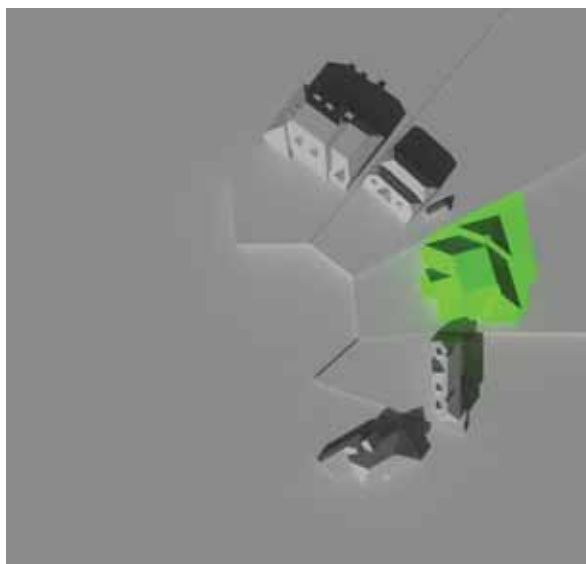
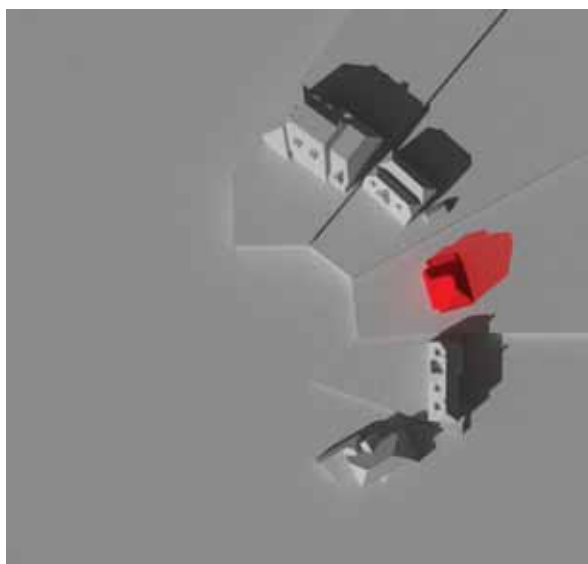
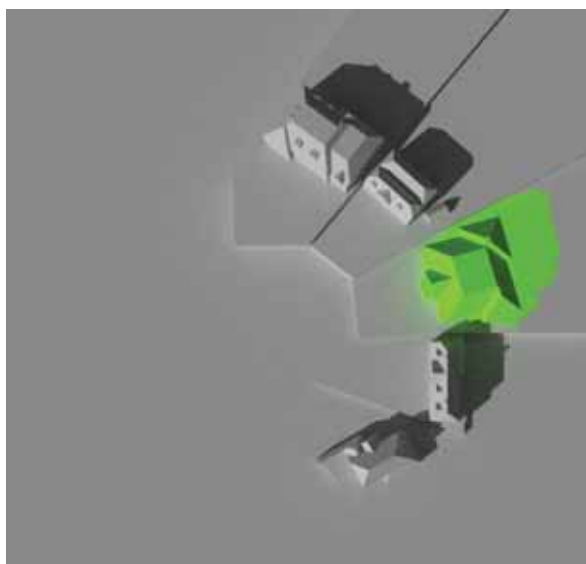


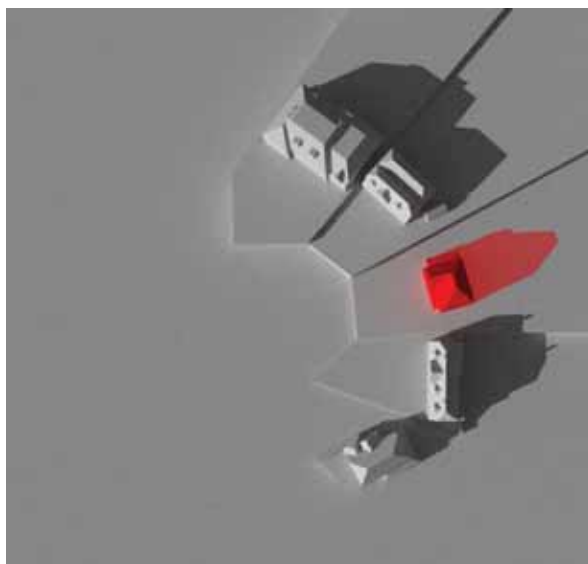
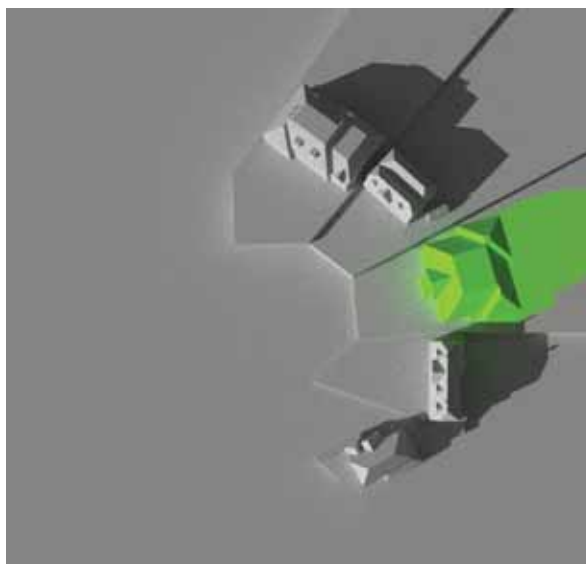
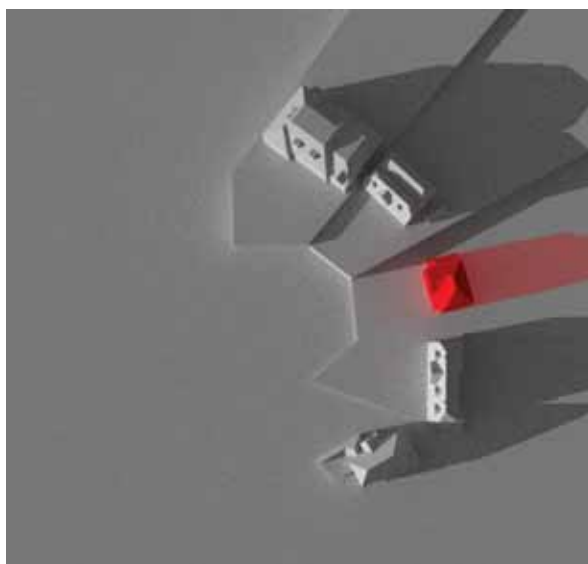
Proposed Site Layout – Spring Equinox - 21st March –
0900 hrs



Existing Site Layout – Spring Equinox - 21st March –
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1600 hrsExisting Site Layout – Spring Equinox - 21st March –
1700 hrsProposed Site Layout – Spring Equinox - 21st March –
1700 hrs