



**Dwyer Road
Daylight, Sunlight and
Overshadowing**

April 2023



Report presented by HTA Design LLP

Status: Final

Issue: 2

Issue Date **20.04.23**

File name *Dwyer Road Daylight, Sunlight
and overshadowing Assessment*

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Executive Summary

HTA Sustainable Futures have been appointed to carry out a Daylight, Sunlight and Overshadowing Assessment for the proposed development at Dwyer road, in the Reading Borough Council.

The development comprises the development of a residential scheme which will contain parking areas and biodiverse green roof for all flat roofs. The proposal provides a total of 31 new homes between 2 and 3 storeys and 15 flats in a 4 storey apartment block. All homes enjoy private external amenity in addition to communal residents external amenity spaces.

Residential Use

The scheme provides a total of 31 new homes with a bespoke building designed to meet the needs of council tenants wishing to downsize to apartments. The scheme provides 16 houses with a mix of 3, 4 and 5-bedroom homes and 15 single-bedroom apartments with 2 M4 (3) wheelchair-adaptable homes on the ground floor. All of them contain private amenity spaces and shared gardens for the apartments as well as a private back garden for all the houses of the proposed development.

All 31 houses and apartments are Affordable and designed to meet at minimum National Described Space Standards.

All residential units are dual aspect, facilitating natural ventilation and access to natural light. All homes enjoy private external amenities in addition to private rear gardens or balconies for the apartments. Additional communal amenity space for apartments is provided as a shared garden.

The analysis has been carried out in accordance with the new BRE's guide 'Site Layout Planning for Sunlight and Daylight: A Guide to Good Practice', P J Littlefair (2022). According to the BRE guide:

'...the advice given here is not mandatory and this document should not be seen as an instrument of planning policy. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design. In special circumstances the developer or planning authority may wish to use different target

values' such as a dense urban environment.'

The Daylight and Sunlight assessment was carried out using the following checks in accordance with the BRE Guide (2022):

Daylight Assessment:

- **Existing properties:**
 - 25 degree angular check, and
 - Vertical Sky Component (VSC)
 - No-Sky Line (NSL)
- **Proposed dwellings:**
 - Illuminance (SDA-Spatial Daylight Autonomy),
 - No-Sky Line (NSL)

Sunlight Assessment:

- **Existing properties and proposed dwellings:**
 - 25 degree angular check
 - Annual Probable Sunlight Hours (APSH) and Winter Probable Sunlight Hours (WPSH)
- **Proposed dwellings:**
 - Sunlight exposure

External spaces:

- **Existing properties and proposed dwellings:**
 - Sunlight on the ground and Overshadowing.

The National Planning Policy Framework (NPPF) (July 2021) states that 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 an efficient use of a site. The NPPF sets out at paragraph 11 that planning policies and decisions should promote the effective use of land in meeting the need for new homes, whilst safeguarding and improving the environment and ensuring safe and healthy living conditions.

Daylight

Impact on the existing buildings

The daylight analysis considered all the **surrounding buildings** with main windows facing the development. The following properties were assessed against the daylight criteria:

- 141 Appleford Road
- Charles Clore Court

Initial analyses were conducted to assess the likely impact that the existing properties surrounding the site would receive from the new building. As the BRE guide explains, it is important to apply the BRE targets sensibly and flexibly, with careful consideration of the specific site context. The BRE also notes that alternative targets might be set depending on the urban context of the site.

The NPPF asks local planning authorities to consider whether satisfactory living conditions are achieved within future developments.

A total of 61 windows that belong to residential units that are in close proximity and face the proposed development have been assessed.

The results show that 84% of the analysed windows achieved VSC levels in line with the BRE recommendations. In summary

- 51 out of 61 windows achieved VSC values more than 27% or their reduction is no more than 20% of their former value.
- 6 out of the remaining 10 windows achieved VSC values higher than 20%, which is considered to be a satisfactory level of daylight.
- The remaining 4 windows are located in the ground and first floor of Charles Court which is in a close proximity with the proposed scheme. It is also important to mention where there is a more than a 20% reduction in VSC, does not mean that the level of daylight will be unacceptable but, rather, that there may be a noticeable change in daylight levels to the occupants. More specifically one window out of the 4 above windows, which is located to the ground floor of Charles court and facing the new development, falls into this category.

Assessment of the proposed development

Daylight levels of the proposed blocks have been tested. The Illuminance (SDA) has been carried out to assess the daylight availability within representative habitable rooms of the proposed scheme.

For the purpose of this study, a total of 47 habitable rooms have been assessed. 81% of the proposed rooms pass the recommended Illuminance target.

There are 9 rooms achieving SDA values below the recommended target. More specifically, 4 bedrooms 4 kitchen-living-dining rooms and one kitchen do not meet the illuminance criteria. Out of 9 rooms not meeting the criteria, one Living Kitchen Dining space (LKD) and 2 bedrooms marginally fall below the criteria with 5-10% below the passing target (50%). Of the remaining 6, one is a kitchen room located on the ground floor of the middle terrace houses, one is a bedroom located on the 1st floor of the apartment block and the remaining 4 are LKDs, all of them located respectively from the ground till the 3rd floor

of the apartment block. Most of these windows are located on lower floors underneath balcony slabs and external shading devices.

Early stage collaboration with the design team increased the design opportunities in regards to balancing the daylight/sunlight, overheating and energy performance.

Overall the results are acceptable.

Sunlight

Impact on the existing buildings

The impact of the proposed development on the existing surrounding buildings has been assessed in terms of sunlight provision. The annual and winter Sunlight (APSH) analysis was carried out on the south-facing windows of the existing surrounding properties next to the Proposed Development. The following property was assessed:

- Charles Clore Court

A total of 34 windows from buildings surrounding the site were assessed for sunlight access. The analysis indicated that 91% of windows satisfied the BRE criteria for annual probable sunlight hours (APSH) and 74% of windows for winter probable sunlight hours (WPSH).

Out of 34 windows within 90° due south, 31 achieved Annual sunlight values (APSH) of more than 27%. It is important to mention that most of these windows only present a reduction in annual sunlight compared to the existing condition. The remaining 3 windows fall marginally below the Annual sunlight target and are located in close proximity to the proposed scheme and to the southeast of the emerging building, therefore, it is expected to have fewer hours of sunlight during the day, especially during winter. Similarly, 9 out of 34 assessed windows for Sunlight are falling below the Winter Sunlight target set by BRE. This was expected as these windows are all located in close proximity to the proposed scheme as well as facing to the east with a result having fewer hours of sunlight over a day.

Overall, the proposed development at Dwyer Road is not considered to have any notable impact on sunlight access to windows of surrounding developments.

Assessment of the proposed development

For the purpose of this study 13 South facing living rooms have been tested. To assess the sunlight provision within the scheme the BRE guide recommends that living rooms that face within 90° due south should be tested.

The results show that all of the 13 tested living rooms achieve adequate sunlight through the year. The results are deemed acceptable.

Sunlight on the ground - Overshadowing

Impact on the existing buildings

A review of the site plan showed that there are 3 amenity spaces located to the north of the proposed development that may be affected. A Solar Access Analysis was undertaken on this amenity area for the full 24 hours on 21 March as set out by the BRE. The analysis was carried out for both configurations, existing and proposed.

Overall, the amenity spaces, will achieve sunlight availability in line with the BRE criteria. The results show that there is no reduction compared to the former values.

Assessment of the proposed development

The study of the external amenity areas includes the new external spaces which are part of the proposed development. 17 spaces have been tested for this analysis. The results of the sun-on-the-ground analysis indicate that 12 out of the 17 in total assessed amenity spaces complies with the requirements described in the BRE guidelines on 21 March. The remaining 5 private gardens are falling below the target. At this point, it is important to note that all the private gardens and the open space are well sunlit over the summer (21st of June) when the spaces are more likely to be used.

Overall, it could be concluded that the proposed development will offer adequate levels of daylight and sunlight to future occupants, the living spaces and to the external amenity areas throughout the year.

In terms of impact on the surrounding properties, the proposed development will not cause unacceptable harm to the surrounding residential amenity. The daylight and sunlight levels are appropriate to the urban context and the overall results are, therefore, considered acceptable against the relevant planning policies and guidance.

Balancing Daylight and Sunlight with Energy and Overheating

This daylight, sunlight and overshadowing report is one of the early reports produced since the new Part O of the Building Regulations came into force. Part O deals with overheating in buildings and sets a number of requirements for windows and ventilation. This is a fundamental change in the design of buildings in the UK and brings regulatory power to bear on the problem of overheating in buildings. This means that designers have a higher priority to design for overheating than for daylight, as compliance with overheating is now a mandatory requirement, whereas compliance with daylight guidance is not. This means inevitably that where there is a choice to be made between meeting overheating criteria in a design and meeting daylight guidance, the designer is forced to meet the overheating criteria. At this point it is also important to note that the consequences of overheating are more serious for well-being of the residents than the consequences of lower levels of daylight.

The design and sizing of windows is now a complex exercise where three sets of conflicting requirements must be balanced, the need to reduce CO2 emissions which suggests smaller, higher performing windows, the need to provide shade and ventilation to reduce risk of overheating, which suggests smaller but openable windows, and finally daylight which usually suggests larger, and less shaded windows.

The design team have tried to balance all of these criteria as well as possible, while still protecting the architecture of the project and ensuring an optimal number of windows that can be manufactured, supplied and cleaned. Inevitably there are some locations where either overheating is more likely, or some energy efficiency has been sacrificed, or where daylight targets are not met. There is a further requirement to enable ventilation at night time when overheating is most problematic. This depends on the Acoustic characteristics of the surrounding areas and further affects window and ventilation design.

The difference in measurement and analysis means that homes with very good daylight are more likely to be at risk of overheating, whereas those with lower daylight levels will not be at risk of overheating. Moreover, there is a further requirement to enable ventilation at night time when overheating is most problematic. This depends on the Acoustic characteristics of the surrounding areas and further affects window and ventilation design.

1.0 Introduction

HTA Sustainable Futures have been instructed to prepare a Daylight and Sunlight study to assess the impact of the proposed development at Dwyer Road at Reading Borough Council. Daylight and sunlight in main living areas, i.e. Kitchens, living rooms and bedrooms, of the proposed development as well as sunlight provision in outdoor amenity spaces have been also assessed.

Daylight and sunlight calculations have been carried out in accordance with BRE's 'Site Layout Planning for Sunlight and Daylight: A Guide to Good Practice' (2022) by P J Littlefair, which is generally accepted as good practice by planning authorities.

The BRE Guide gives advice on site layout to achieve provision of daylight and sunlight both within buildings and in the open spaces between them. It aims to aid designers in considering the relationship between new and existing buildings to ensure that each retains the potential to achieve good daylight and sunlight levels.

Section 4 of this report briefly describes the BRE methodology and the design standards. Sections 6, 7 and 8 provide a summary of the outcome of the analysis.

BRE guidelines have been drafted primarily for use with low-density suburban developments and should be used flexibly when dealing with dense urban sites and extensions to existing buildings. The Guide states in the introduction:

"The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and the 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 site layout design. In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings."

Current design challenges, increasingly across the UK, revolve around achieving a design balance between daylight, energy, and overheating requirements.

Many standards and guidance documents, as well as building regulations, revolve around facades and windows, making the task of designers very complex and increasingly time consuming. Recent contradictory

changes in daylight guidance and overheating, is making designers work much harder, is pushing up fee levels for consultants and leading to increases in non compliance against some of these standards.

To explain, there are some specific performance requirements for buildings in new guidance and regulations that are at odds with each other and which need careful and timely analysis during design stages of residential buildings.

Firstly, Greater London Authority guidance on energy performance requires a 10% reduction in CO2 emissions before heating systems are considered. The purpose of this is to seek improvements in building fabric before other improvements are applied, otherwise known as a 'fabric first approach'. This requirement tends to push down on window sizes and to push up the energy performance of the facade.

Secondly, BRE Daylight standards, recently revised in 2022 to align with other European standards, seeks to equalise the daylight within rooms and pushes windows to be larger.

Finally we have the introduction of Building Regulations Part O in 2022 which applies to all residential buildings across the UK and requires designers to demonstrate that the home will not overheat under the specific conditions laid out in the document. This has the effect of reducing window sizes but increasing the ventilation requirements, and it is affected by local acoustic conditions.

The balancing of these issues is complex and not obvious, and requires in-depth analysis at an early stage of design. Previously it was only within the GLA area that overheating calculations were required, now it's everywhere across the UK whether using a simplified method or software modelling. Within the GLA area dynamic modelling is required as London is an area of higher risk than much of the UK due to the higher temperatures in urban areas.

These changes will require a change in behaviour of planning officers who typically priorities daylight issues much more than energy issues. The link between design quality and daylight seems more obvious to clients and planners alike than the link between low energy buildings and design quality.

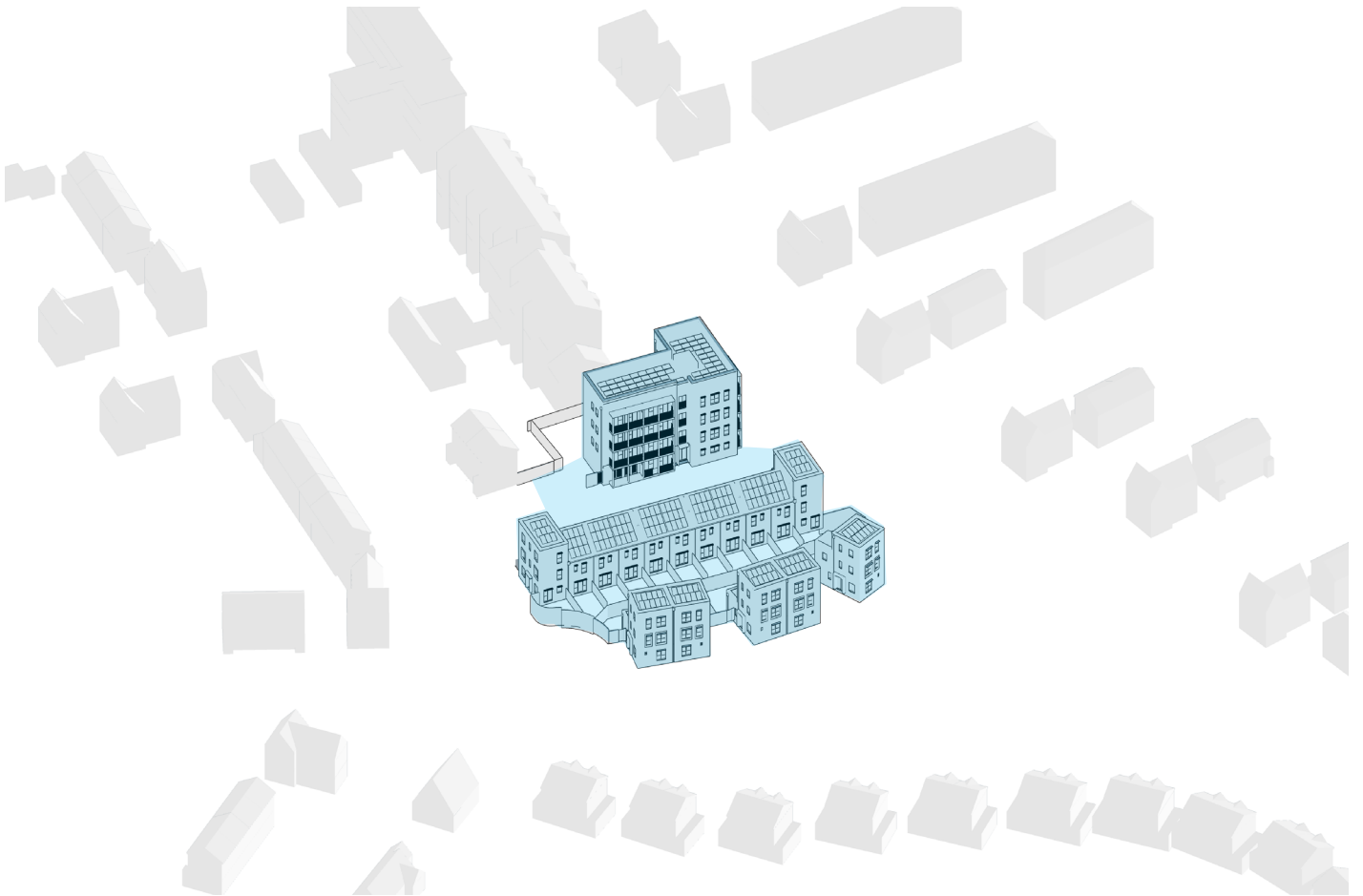


Figure 1 - 3D view

2.0 Site description

Site Overview

The site is located in the southwest area of the Borough in the Southcote ward, southwest of Reading Town Centre.

The site is located between Bath Road, and the Reading-Theale trainline to the south. To the west is Burghfield Road and the Southcote Estate. The area is predominantly residential, with a number of local primary schools and community centres throughout. There are shops and local facilities located on Bath Road with smaller local shops within Southcote Estate to the east.

Reading Borough Council has an ambition to provide an additional 15,847 homes (averaging 689 homes per annum) for the period 2013 to 2036 (Policy H1).

The aim for the Dwyer Road site is to consider general needs housing alongside downsizer apartment. Capacity on site will rely on balancing housing provision alongside associated car parking levels, amenity and landscape and biodiversity aspirations.

Location

The site is located within a residential zone of Reading with houses and flatted development 2 storeys in height, while the extra care facility immediately to the north is a five-storey development.

The overall site area is approximately 0.49 hectares.

Previously used as the Alice Burrows Care House, the services were closed in 2007 and the building demolished nearly 15 years ago. The vacant site is now secured and hoarded for the full perimeter, with the exception of a chain link fence to the north along the boundary to Charles Clore Court.

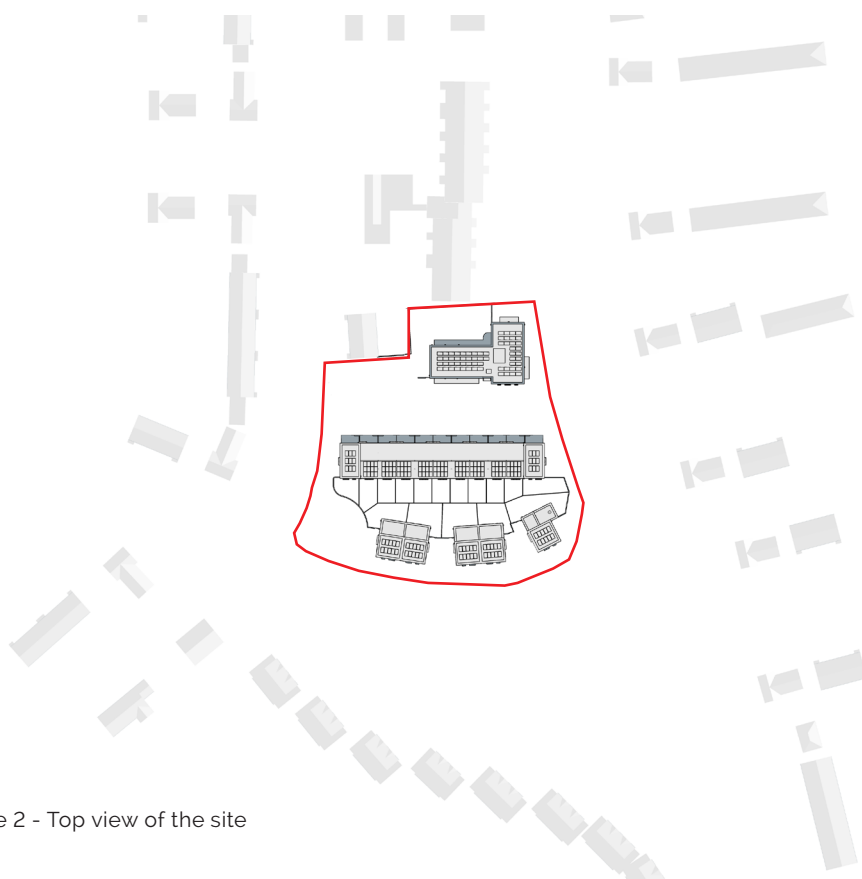


Figure 2 - Top view of the site



3.0 Planning policy

National Planning Policy Framework (2021)

The National Planning Policy Framework was revised in July 2021 and paragraph 125, part C states that:

[...] 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.

National Planning Practice Guidance

This was last revised on 22.07.2019. Paragraph 006 of Reference ID: 66-006-20190722 states that:

Where a planning application is submitted, local planning authorities will need to consider whether the proposed development would have an unreasonable impact on the daylight and sunlight levels enjoyed by neighbouring occupiers, as well as assessing whether daylight and sunlight within the development itself will provide satisfactory living conditions for future occupants. [...].

- [...].
- Smell;
- Crime and safety; or
- Wind, where the proposals involve new development of more than 8 storeys.

The position of habitable rooms, windows and outdoor living spaces will be particularly important. A back-to-back distance of 20 metres between dwellings is usually appropriate, although the circumstances on individual sites may enable dwellings to be closer without a detrimental effect on privacy.

As well as immediate impacts, other aspects to which this policy applies will include matters such as hours of operation of businesses, and effects of traffic movements, particularly of heavy goods vehicles (HGVs). Proposals which would generate regular movements of HGVs on residential roads will not be acceptable.

Where an otherwise acceptable development could change its character to a use that would have a greater impact on amenity without needing planning permission, conditions will be applied to restrict such changes.

Local policy

Reading Borough Local Plan (2019)

Design and the Public Realm:

Safeguarding Amenity:

CC8: SAFEGUARDING AMENITY

Development will not cause a detrimental impact on the living environment of existing residential properties or unacceptable living conditions for new residential properties, in terms of:

- Privacy and overlooking;
- Access to sunlight and daylight;
- Visual dominance and overbearing effects of a development;
- Harm to outlook;
- Noise and disturbance;
- Artificial lighting;
- Vibration;
- Dust and fumes;
- Smell; [...].

House Extensions and Ancillary Accommodation:

H9: HOUSE EXTENSIONS AND ANCILLARY ACCOMMODATION

An extension to a house or other householder development will be acceptable where it:

- Respects the character and appearance of the house in terms of scale, location, materials and design;
- Respects the character and pattern of neighbouring properties and appearance of the street as a whole in terms of scale, location, materials and design, the arrangement of doors, windows and other principal architectural features and any important existing building line;
- Does not present an overbearing impact on neighbours or a large blank façade to public areas; and
- Does not result in a loss of biodiversity within gardens. [...].

Reading, Development Plan Strategy (2026)

Chapter 1:

Local policy

Reading Borough Council Local Plan (2019)

The Reading Borough Council: "Declared a Climate Emergency in 2019, and set out its commitment to work towards achieving a carbon neutral Reading by 2030 [...] the Local Plan contains sustainability policies that put it at the cutting edge of authorities across the country [...] Reading is in the top 5% of local authorities in Britain for cutting carbon emissions and the Local Plan will play a major part in building upon that success."

Vision for Reading 2050

"In parallel to the drafting of the Local Plan to 2036, Reading UK, the economic development and marketing company for Reading, has launched a 2050 vision for the town as a smart and sustainable city by 2050 [...] By 2050 it envisages that Reading will be a smart and sustainable city that:

- Shares success to support and enable thriving communities;
- Delivers a real sense of place and identity;
- Thrives on cultural and cross-generational diversity;
- Is recognised for its heritage and natural assets;
- Embeds technology to deliver innovation and low carbon living for all; and
- Welcomes ethical and sustainable businesses who support Reading."

The following sustainability objectives are set alongside the objectives of other plans, such as the Climate Change Strategy 2013-2020 (Reading Means Business on Climate Change).

"Improve the quality of life for those living, working, studying in and visiting the Borough, creating inclusive, sustainable communities with good access to employment, open space and waterspace, transport, education, services and facilities (such as sustainable water supplies and wastewater treatment, healthcare services, social and community facilities, sport and recreation, etc.) to meet identified needs;"

Policy CC3 - Adaptation to climate change

"All developments will demonstrate how they have been designed to incorporate measures to adapt to climate change.

The following measures shall be incorporated into development:

- Wherever possible, new buildings shall be orientated to maximise the opportunities for both natural heating and ventilation and reducing exposure to wind and other elements;

- Proposals involving both new and existing buildings shall demonstrate how they have been designed to maximise

resistance and resilience to climate change for example by including measures such as solar shading, thermal mass,

heating and ventilation of the building and appropriately coloured materials in areas exposed to direct sunlight, green and brown roofs, green walls, etc;

- Use of trees and other planting, where appropriate as part of a landscape scheme, to provide shading of amenity

areas, buildings and streets and to help to connect habitat, designed with native plants that are carefully selected,

managed and adaptable to meet the predicted changed climatic conditions; and

- All development shall minimise the impact of surface water runoff from the development in the design of the drainage

system, and where possible incorporate mitigation and resilience measures for any increases in river flooding levels

as a result of climate change."

4.0 Methodology - Assessment criteria

The Daylight and Sunlight Assessment, presented in this report, has been carried out in compliance with the methodology outlined in the Building Research Establishment (BRE) Guide 'Site Layout Planning for Sunlight and Daylight: A Guide to Good Practice' by P J Littlefair (2022). The third BRE guide edition has introduced new methodology for the assessment of the proposed development. The strategy for the impact assessment remains unchanged.

4.1 Daylight - Impact on existing properties

The design of a new development should safeguard potential for daylight to nearby buildings. Otherwise, obstruction caused by new built sites may make surrounding properties look gloomy and unattractive.

BRE guidelines are intended for use for living areas in adjoining dwellings or main occupied spaces in non domestic buildings where daylight is required. The methodology to assess the impact on daylight access of the properties surrounding the development is as follows:

Angular check

This test should only be used where the proposed development is of a reasonably uniform profile and is directly opposite the existing building. A plane is drawn at 25 degrees from the horizontal at the centre of an existing window. If the new development intersects with this plane, i.e. the obstruction angle is greater than 25 degrees, daylight access of the assessed window may be reduced. A more detailed assessment should be then carried out to calculate the loss of daylight to the existing window.

Buildings that are not directly facing the new development may still experience a change to their lighting condition and therefore the 45 degrees approach method should be applied to assess the impact. A horizontal plane should be drawn from the highest point of the proposed development angled at 45 degrees downward. If existing windows fall within the area created by the existing building, proposed development and the angled plane, these should be also included in the assessment.

Vertical Sky Component method (VSC)

The Vertical Sky Component (VSC) quantifies the amount

of available daylight, received at a particular window and measured on the outer pane of the window. This is the ratio, expressed as a percentage, of the direct illuminance falling on a reference point (usually the centre of the window) to the simultaneous horizontal illuminance under an unobstructed sky (overcast sky conditions). The maximum value of VSC for a completed unobstructed vertical window pane is 40%.

In order to maintain good levels of daylight the BRE guidance recommend that the VSC of a window should be 27% or greater. However, the 2022 BRE Handbook makes allowance for different target values in cases where a higher degree of obstruction may be unavoidable such as historic city centres or modern high rise buildings. The guide states that the 27% value is:

"..purely advisory and different targets may be used on the special requirements of the proposed development or its location".

If the VSC is less than 27% then further assessment should be carried out to compare existing and proposed daylight levels received by an existing window.

Comparison method

The comparison test considers the VSC results of the baseline/existing condition and the VSC results assuming that the new development is in place. The 2022 BRE Handbook states that where the proposed VSC is less than 27%, the comparison with the existing situation should be analysed and if the VSC is less than 0.8 times its former value, occupants of the existing building may notice a reduction in the amount of daylight.

4.2 Daylight - New Development

The quality and quantity of daylighting in an interior space depends on two main factors: external environment and internal layout. External environment, e.g. Obstruction from neighbouring buildings or topographical features has an impact on daylight provision whereas internal layout and windows' size affects daylight distribution within a living area.

Section 2.1 of the new BRE guide provide several methods for calculating daylight levels within new developments.

According to the new BRE guide and BS EN 17037, only main living areas within a dwelling, i.e. Kitchens, living/dining rooms and bedrooms, should be assessed against the criteria provided, as these are occupied for a long period throughout the day and daylighting is essential for carrying out tasks. Therefore, secondary spaces, e.g. Circulation areas, bathrooms and storerooms, are excluded from this study.

Vertical Sky Component

According to BRE Guide, if VSC as measured at the centre of a window is at least 27% then the living space is expected to receive good daylight levels.

The VSC, however, is a general measure of potential for daylight in a space that does not take into consideration the function of the space being assessed and should be carried out at early design when rooms' layout is not yet determined and the optimum position of windows is being assessed. Therefore, VSC calculation has been omitted from this study for the proposed development.

Illuminance method

For daylight provision in buildings, BS EN 17037 provides two methodologies. One is based on target illuminances (SDA-Spatial Daylight Autonomy) from daylight to be achieved over specified fractions of the reference plane for at least half of the daylight hours in a typical year. The other, alternative, method is based on calculating the daylight factors achieved over specified fractions of the reference plane. The alternative DF method has been omitted from this study.

The UK National Annex gives illuminance recommendations of 100 lux in bedrooms, 150 lux in living rooms and 200 lux in kitchens. These are the median illuminances, to be exceeded over at least 50% of the assessment points in the room for at least half of the daylight hours.

Position of the No-Sky Line

A measure to assess the distribution of daylight in a space is the percentage of area that lays beyond the no-sky line i.e. The area that receives no direct skylight. This is important as it indicates how good the distribution of daylight is in a room. If more than 20% of the working plane lies beyond

the no-sky line poor daylight levels are expected within the space.

The following table summarises the assessment criteria as described in the BRE Guide that should be applied to new developments in order to ensure good daylight levels within the main living areas of residential units.

For the purposes of this study, the illuminance (SDA) and No-Sky view have been calculated.

Table 01 - Daylight criteria for the assessment of the daylight levels of new buildings

Measure of Interior Daylight	Benchmark		Daylight Criterion
Illuminance (SDA)	50%	200 LUX	Minimum value of SDA for Kitchens
	50%	150 LUX	Minimum value of SDA for Living rooms
	50%	100 LUX	Minimum value of SDA for Bedrooms
No-Sky View	80%		There will be a good distribution of light in the room if at least 80% of the working plane receives direct skylight.

4.3 Sunlight - Impact existing properties

The impact of the new development on the sunlight levels received by the neighbouring residential buildings has been carried out in accordance with the BRE Guide.

The methodology is based on guidelines set out in the 2022 BRE Handbook. Only windows facing 90° of due south have been considered in the analysis. The methodology to assess the impact on the sunlight access of the properties surrounding the new development is as follows:

Angular check

This test should only be used where the proposed development is of a reasonably uniform profile and is directly opposite the existing building. A plane is drawn at 25 degrees from the horizontal at the centre of an existing window. If the new development intersects with this plane, i.e. the obstruction angle is greater than 25°, daylight access of the assessed window may be reduced. A more detailed assessment should be then carried out to calculate the loss of daylight to the existing window.

Annual Probable Sunlight Hours

BRE have produced sunlight templates for London, Manchester and Edinburgh indicating the Annual Probable Sunlight Hours (APSH) for these regions. The London template has been selected for this study which has an APSH of 1,486 hours and a Winter Probable Sunlight Hours of 446 hours. The same VSC reference points are used for the calculation of the APSH and WPSH. It should be considered that sunlight is deemed less important in kitchens and bedrooms.

The 2022 BRE Handbook states:

"In houses, the main requirement for sunlight is in living rooms, where it is valued at any time of day, but especially in the afternoon".

The 2022 BRE Handbook also states:

"...a south facing window will, in general, receive most sunlight, while a north facing one will receive it only on a handful of occasions. East and west facing windows will receive sunlight only at certain times of day".

According to the BRE guide, for a space to be reasonably sunlit:

- At least one main window wall should face within 90° of due south and,
- The centre of at least one window to a main living room should receive 25% of annual probable sunlight hours, including at least 5% of annual probable sunlight hours in the winter months between 21 September and 21 March. If a room has multiple windows on the same wall or on adjacent walls, the highest value of APSH should be taken. If a room has two windows on opposite walls, the APSH due to each can be added together.

If the available sunlight hours are below the above thresholds then an additional assessment should be carried out.

Comparison method

The comparison test considers the APSH and WPSH results of the baseline condition and the APSH and WPSH results of the Development in place. The BRE guidance say that if the reduction in sunlight between the baseline condition and the future one results in an APSH and WPSH of at least 0.8 times its former value, then it is considered that the sunlight received is adequate.

4.4 Sunlight - New development

Sunlight Exposure

Sunlight is valued as it provides dwellings with light and warmth and it also allows for passive heating through solar gains that reduces heating energy consumption. Optimum arrangement of the site to produce the best orientation (within 90° of due south) and reduce overshadowing should be considered in order to take advantage of solar energy during winter time.

According to BRE Guide (2022), the main requirement for sunlight in housing is in living rooms, whereas in bedrooms and kitchens sunlight is viewed as less important.

For interiors, access to sunlight can be quantified. BS EN 17037[1] recommends that a space should receive a minimum of 1.5 hours of direct sunlight on a selected date between 1 February and 21 March with cloudless conditions. It is suggested that 21 March (equinox) be used.

For dwellings, at least one habitable room, preferably a main living room, should meet at least the minimum criterion.

According to the BRE Guide, in high-density developments it becomes difficult to avoid some dwellings being seriously obstructed or having a poor orientation. Where prolonged access to sunlight is available, measures to avoid overheating and unwanted glare from the sun are necessary.

4.5 Overshadowing - Gardens and open spaces

Existing spaces

The methodology is based on guidelines set out in the 2022 BRE Handbook that states the following:

"The availability of sunlight should be checked for all open spaces where it will be required. This would normally include: private gardens (usually the main back garden of a house), parks and playing fields, children's playgrounds..."

BRE Guide recommends that for a garden or amenity to appear adequately sunlit throughout the year, at least half of it should receive at least two hours of sunlight on 21 March (Spring Equinox).

The Guide suggests that where large buildings are proposed which may affect a number of amenity spaces it is useful to plot a shadow plan to show the location of shadows at different times of the day on 21st March.

The methodology to assess the sunlight impact of the amenity spaces is as follows: sunlight provision is considered adequate if at least 50% of the amenity space receives two hours of sunlight on 21 March. If otherwise, then a comparison between the existing and proposed conditions is required to test whether the amenity space receives at least 80% of sunlight of its former value. If this is the case the BRE guidance states that the loss of sunlight is negligible.

Proposed development

A good site layout planning should be able to provide not only interiors but also spaces between buildings with adequate levels of daylight and sunlight. This will have an important impact on the overall appearance and ambience of a development by providing attractive sunlit views, making outdoor activities more pleasant, encouraging plant growth etc.

BRE Guide recommends that for a garden or amenity to appear adequately sunlit throughout the year, at least half of it should receive at least two hours of sunlight on 21 March.

5.0 Site model

The Daylight/Sunlight analysis was carried out by creating a three-dimensional model of the proposed development and its surroundings (Figure 3).

A detailed model of the proposed living spaces was also created. All of the residential rooms have been analysed and assessed against the BRE standard. For each unit only kitchens, dining rooms, living rooms and bedrooms were assessed in terms of daylight and sunlight provision.

Floor layouts of the proposed development, shown in Appendix B, highlight those units included in the daylight and sunlight study described in the following sections.

The model was also used to assess the impact on the surrounding buildings in terms of daylight, sunlight and overshadowing.

The calculations were based on the following assumptions:

- Daylight provision in new rooms has been checked using the method in BS EN 17037 Daylight in Buildings[1]: direct prediction of illuminance levels using hourly climate data
- The working plane was set at 0.85m above the floor as per BRE guidance for dwelling
- Clean, clear double glazing with a low emissivity coating was assumed with diffuse visible transmittance of 0.63.

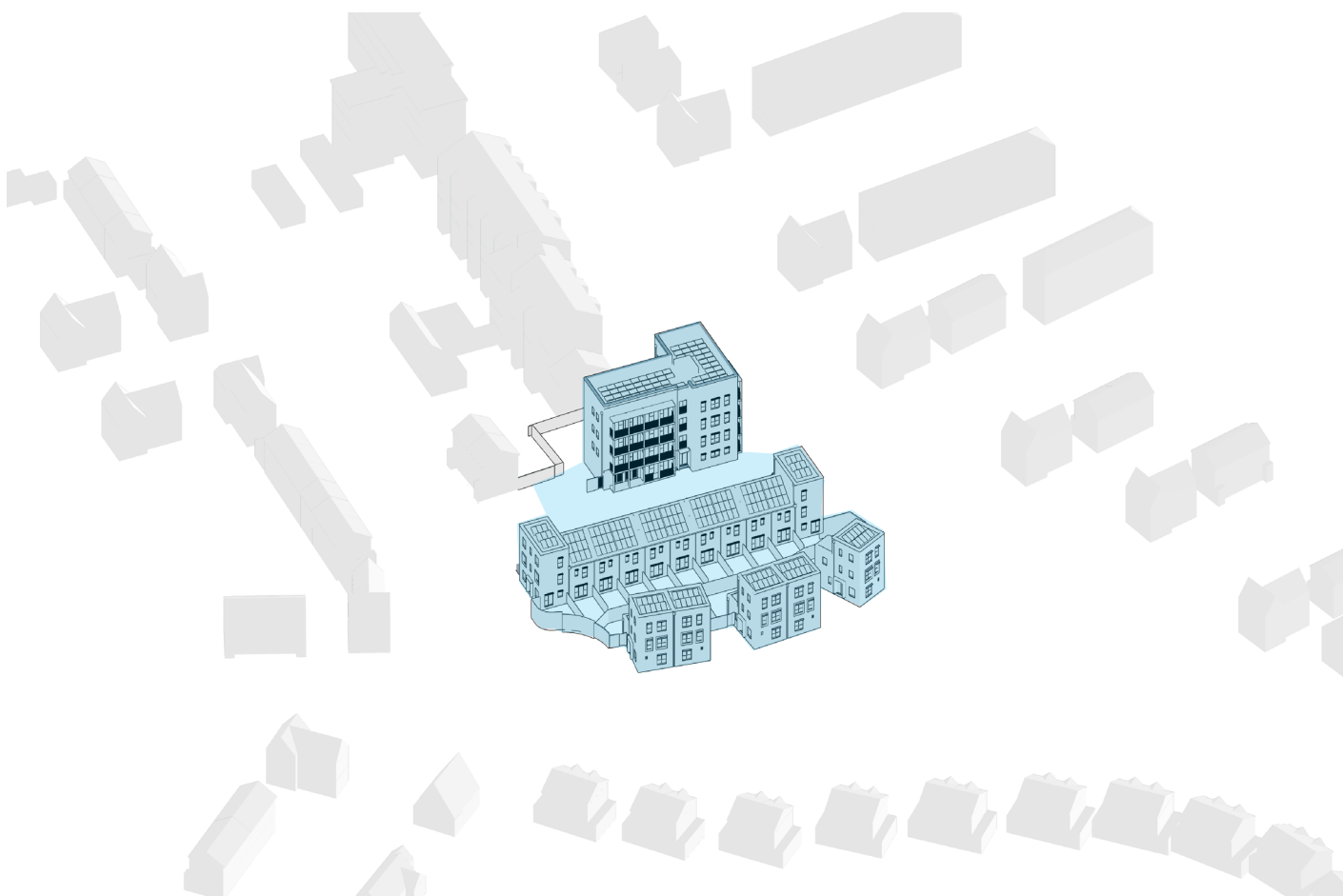


Figure 3 - 3D model of the proposed development and its surroundings

6.0 Daylight assessment

6.1 Impact on existing properties

A daylight analysis has been carried out to assess the impact of the new development on the surrounding existing properties in terms of availability of daylight. Figure 4 shows the location of the existing buildings but also of the emerging building schemes, that surround the proposed development and whose daylight availability may be affected by the new blocks.

Vertical Sky Component (VSC)

The design of a new development should safeguard potential for daylight to nearby buildings. Otherwise, obstruction caused by new built sites may negatively affect neighbouring sites. The Vertical Sky Component (VSC) quantifies the amount of available daylight, received at a particular window and measured on the outer pane of the window. The maximum VSC value for a completely unobstructed vertical window pane is 40%. In order

to maintain good levels of daylight the BRE guidance recommends that the VSC of a window should be 27%. An alternative target can be set in accordance with the urban setting of the site. For example the typical values achieved in an urban context is usually 18% and this can be used as alternative target in configurations where the typical obstruction angle from the ground floor window level is 40°.

As the BRE guide notes, the targets recommended in the guide are purely advisory and different targets may be used based on the special requirements of the proposed development or its location.

The properties analysed in this study are the residential buildings which are located around the site and which might be affected by the Proposed Development.

The following windows which belong to residential buildings directly facing the proposed development pass the 25-degree line test and therefore they are unlikely to

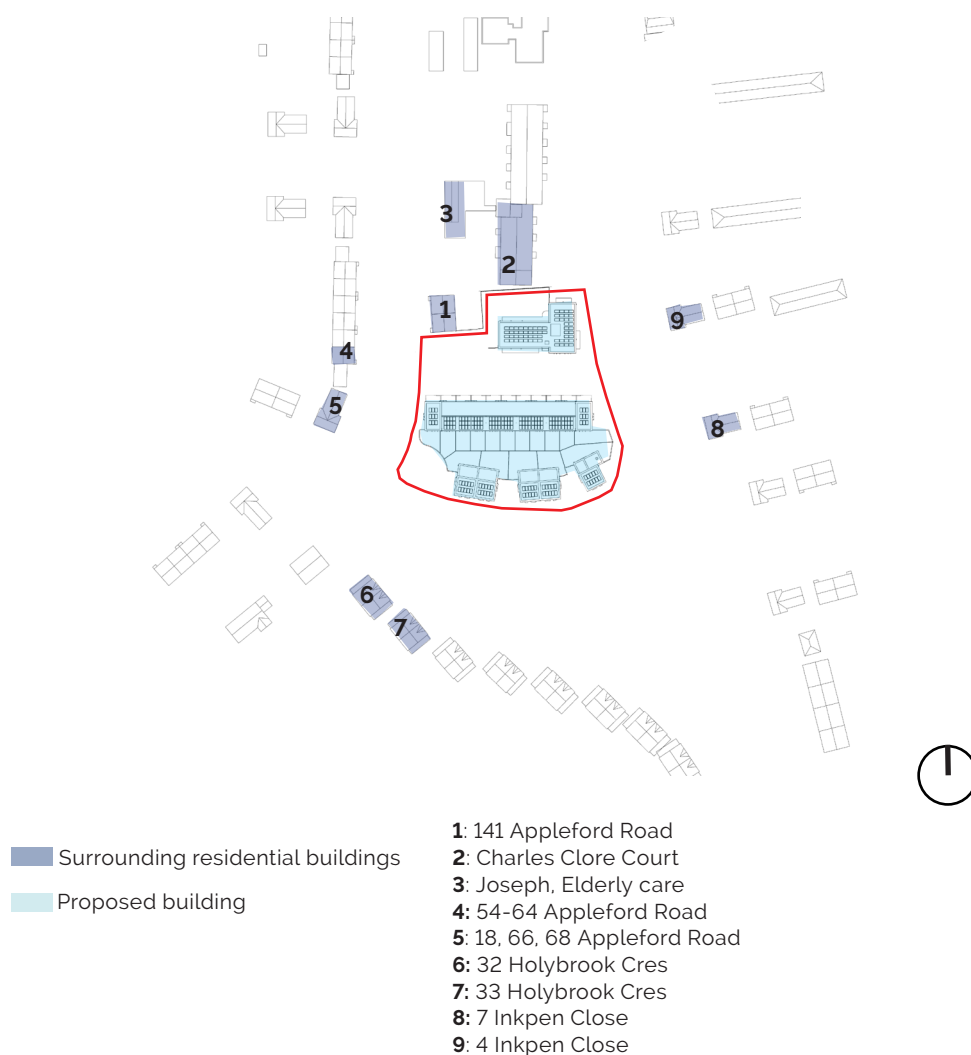
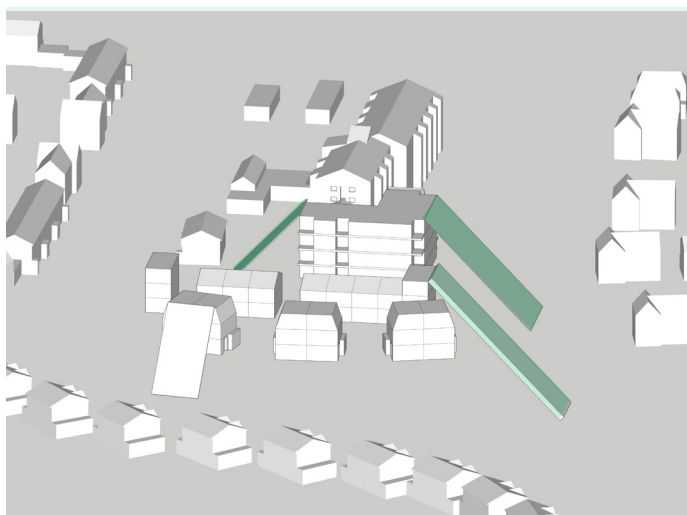
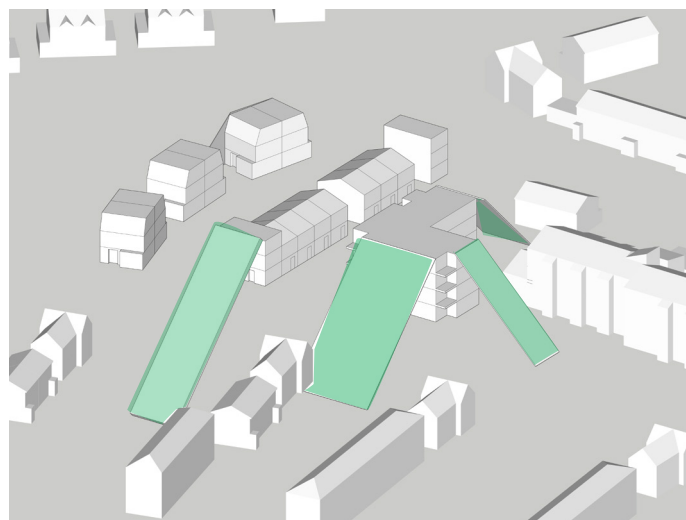


Figure 4 - Site plan with surrounding buildings



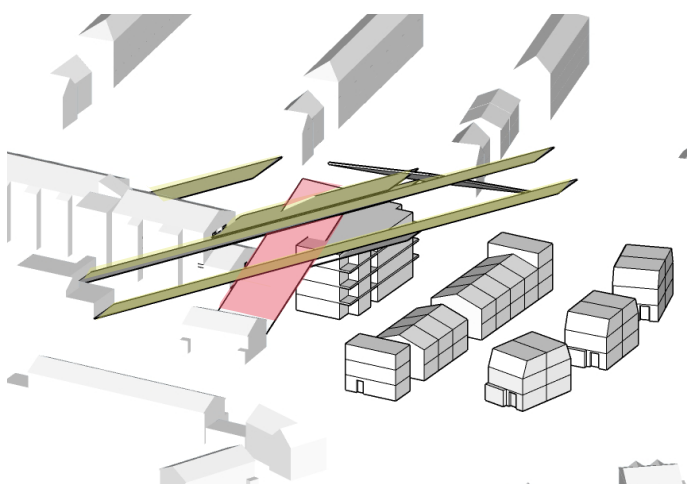
45 degree line check

Figure 5 - Angular check of the surrounding buildings



45 degree line check

Figure 6 - Angular check of the surrounding buildings



25 degree line check: no intersections
(no further analysis is required)

25 degree line check: intersections
(VSC analysis is required)

Figure 7 - Angular check of the surrounding buildings

be affected by the proposed development.

These windows belong to:

- Joseph, Elderly care
- 54-64 Appleford Road
- 18, 66, 68 Appleford Road
- 32 Holybrook Cres
- 33 Holybrook Cres
- 7 Inkpen Close
- 4 Inkpen Close

Several initial studies were conducted to assess the likely impact of the proposed massing to the existing properties with the intention of guiding the design team and provide advice on opportunities for reducing the impact while maximising daylight and sunlight availability within the proposed scheme. Therefore the design was adapted to reduce the impact on the properties.

The conservative targets described in the BRE guide which are typical for low rise configurations are applied for this assessment. Furthermore, the BRE guidance also focuses on 'relative change' which is likely to be exaggerated given the low-rise nature of the existing structures on site. Where there is more than a 20% reduction in VSC, this does not mean that the level of daylight will be unacceptable but, rather, that there may be a noticeable change in daylight levels for the occupants.

The following properties are considered relevant for this development and have been analysed in detail.

- 141 Appleford Road
- Charles Clore Court

The BRE guide explains that any reduction of more than 20% of the former value would be perceived by the human eye and careful considerations are required in assessing the degree of impact caused by the new obstructing

element. Daylight and sunlight is usually more limited in urban contexts given the proximity to the adjacent buildings and the higher levels of obstructions. Therefore, a flexible approach is required in assessing the impact to the existing surrounding buildings.

141 Appleford Road

This residential building is located to the northwest of the site. A detailed assessment was conducted by assessing the VSC at the centre of each windows. The results show that out of the 10 windows tested, 6 windows achieve a VSC higher than 27%, and the remaining 4 windows achieved a VSC marginally below 0.8 of their existing value.

At this point it is important to note that these windows were receiving an excessive amount of daylight in their existing configuration, therefore the results are considered to be acceptable given the low-rise nature of the proposed building in the site.

Overall, the impact from the proposed development on this building is considered acceptable for the scheme of this size and nature.

Charles Clore Court

This is a residential building located in north of the proposed development. The results show that out of 51 analysed windows, 45 windows achieve VSC levels in line with the BRE recommendations. This means that either they achieve a VSC value of at least 27% or that the reduction is no more than 20% of their former value. From the 6 windows falling below the target, 2 windows achieve VSC values greater than 20% which is considerable to be good amount of daylight for an urban environment and the remaining 4 windows are in a close proximity the proposed development.

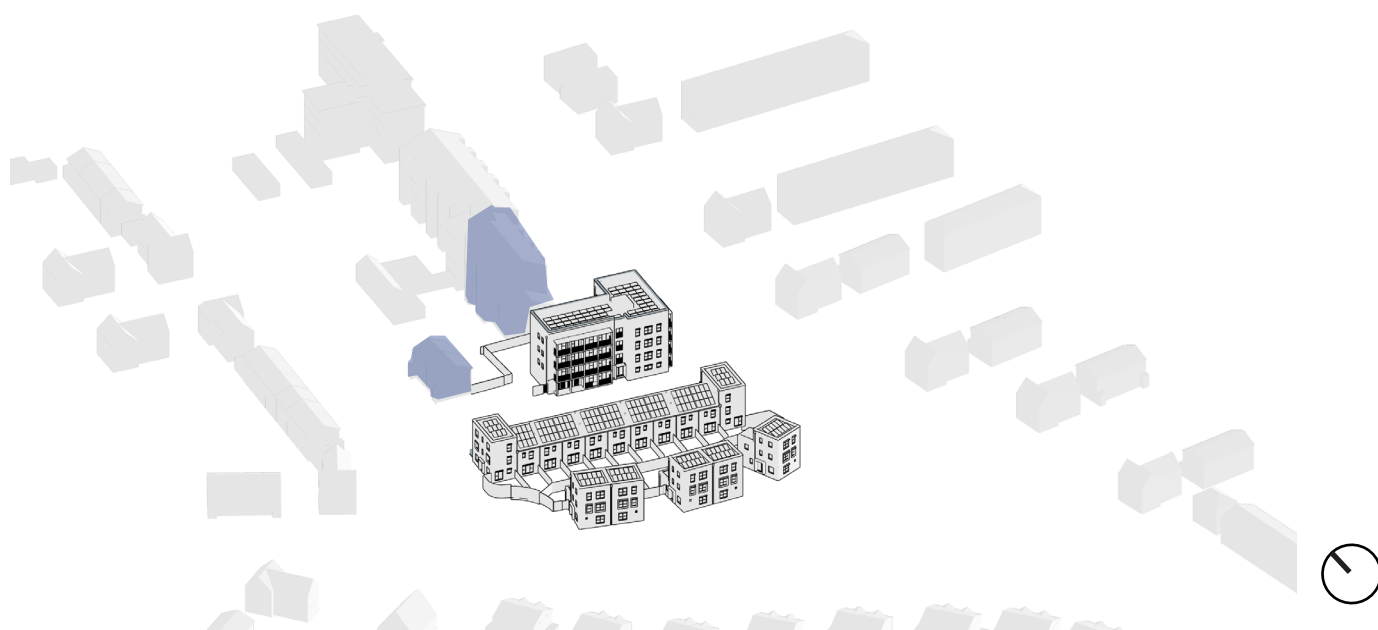


Figure 8 - 3D view of the model used for the analysis and its surrounding buildings

As mentioned previously in the report, where there is more than a 20% reduction in VSC, this does not mean that the level of daylight will be unacceptable but, rather, that there may be a noticeable change in daylight levels to the occupants.

Therefore, given the location of the proposed development, with the height of the immediate neighbouring buildings to the east and west being no more

than two storeys in height, and the currently low-rise nature of the existing site, it is important to take into account that, although the 27% VSC target is the standard criterion available, it is not fully applicable to the development and that a lower VSC target is acceptable.

Overall, the proposed development was not found to have any daylight impact on this property.

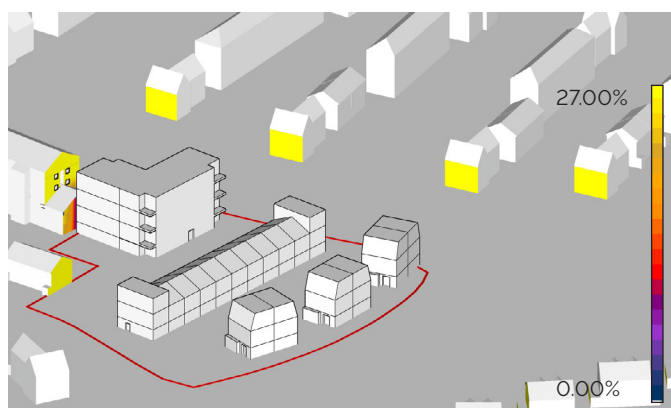


Figure 9 - Vertical Sky Component analysis - Proposed Configuration

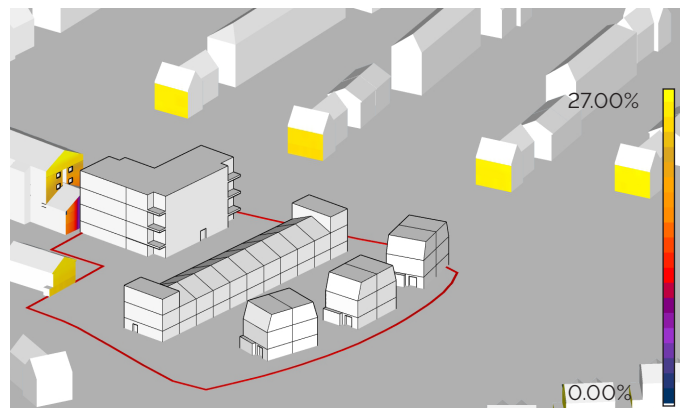


Figure 10 - Vertical Sky Component analysis - Ratio Configuration

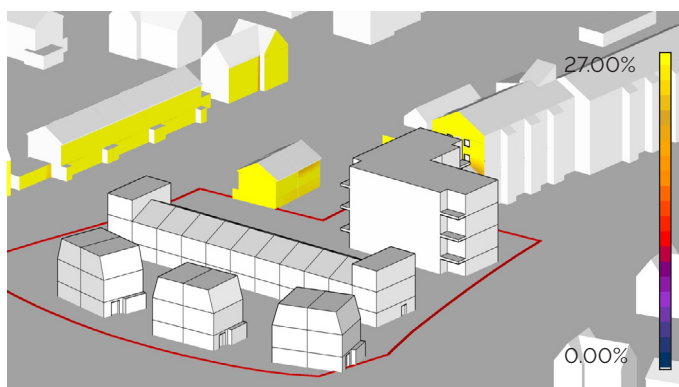


Figure 11 - Vertical Sky Component analysis - Proposed Configuration

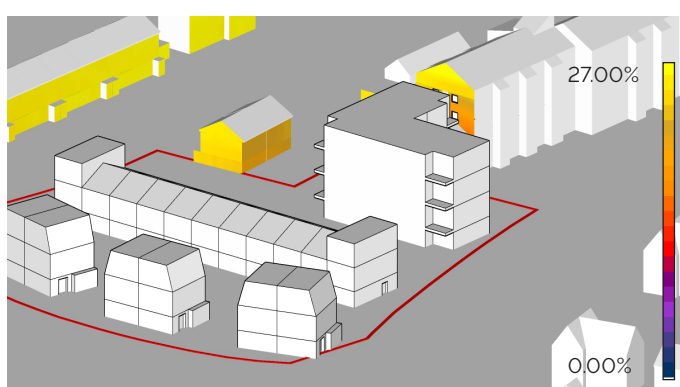


Figure 12 - Vertical Sky Component analysis - Ratio Configuration

Table 02 - Daylight Assessment: Impact on the surrounding buildings - VSC

Property	Number of Window Tested	Windows that meet BRE Guidelines		VSC Windows No. of Rooms Experiencing Adverse Impacts		
		No.	%	20-29.99% loss (minor adverse losses)	30-39.99% loss (moderate adverse losses)	>40% loss (substantial losses)
141 Appleford Road	10	6	60%	4	0	0
Charles Clore Court	51	45	88%	1	2	3
Total	61	51	84%	5	2	3

6.2 Assessment of the proposed development

The daylight analysis was carried out on the proposed design to ensure good daylight levels according to the BRE guidelines.

Tables 2 and 3 present a summary of the daylight analysis results, in terms of daylight provision (Illuminance levels and View of the Sky). A total number of 41 rooms were tested against the new BRE criteria.

* Spatial Daylight Autonomy (SDA) = Illuminance values

Assessment of the proposed design

The three-dimensional representation of the proposed buildings was placed in the context of its surrounding buildings. The existing properties have been modelled from the research of drawings in the planning portal of Reading, the OS map, and site photographs. The simulation assumptions are based on improved values from reflectance, transmittance and maintenance factors as specified in BS EN 1703. The tables below summarise the factors used in the analysis:

Reflectance values:

Surrounding	0.2
Internal walls	0.6
Internal ceiling	0.8
Internal floor	0.4

Transmittance values

Double glazing (Low-E)	0.63
------------------------	------

Maintenance factors

Double Low-E (Frames modelled)	
TV (normal)	0.75
A.3	8
A.4	1
A.5	1
A.6	0.8
TV (Total)	0.55

The results of the illuminance (SDA) analysis (tables 2 and 3) show that 33 rooms, equal to 80% of the total number of assessed spaces, meet the target described in both the BS EN 17037 and the UK National Annex. Detailed results of the analysis can be found in Appendix B1.

There are 8 rooms achieving SDA values below the recommended target. More specifically, 4 bedrooms, 3 kitchen-living-dining rooms and one kitchen do not meet the illuminance criteria. Out of 8 rooms not meeting the

criteria, one LKD and 2 bedrooms marginally fall below the criteria with 5-10% below the passing target (50%). Of the remaining 5, one is a kitchen room located on the ground floor of the middle terrace houses, one is a bedroom located on the 1st floor of the apartment block and the remaining 3 are LKDs, all of them located respectively from the 1st to the 3rd floor of the apartment block. Most of these windows are located on lower floors underneath of the balcony slabs and external shading devices.

The standards provided by the BRE are aimed at maximising daylight and sunlight provision in all parts of rooms so that irrespective of furniture layouts, the rooms function well for daylight. This is an ideal position, but not one that can always be delivered, and runs counter to other factors influencing apartment design.

Many units have deep rooms rather than wide rooms as it is dictated by the site layout and the shape of the building, and these deep rooms are naturally the most difficult rooms to achieve the required SDA levels. However, rooms with lower SDA scores are not necessarily badly daylighted rooms, as the aim of SDA is to equalise daylight over at least 50% of the room. If the tasks and activities that the room is used for can be carried out in the part of the room that has good daylight, then the room is sufficiently daylighted as mentioned above.

Also, the requirement for kitchens and open spaces is higher than the requirement for bedrooms or for separate living rooms. It is, therefore, harder to achieve the minimum target of these rooms in blocks of flats located in urban environments. The numerical results indicate that kitchen-living-dining rooms which include a living rooms and a kitchen often achieve an illuminance value of at least 150 Lux. This is the value recommended for living rooms.

The 'No-Sky Line' divides points on the working plane which can and cannot see the sky. In housing the working plane is assumed to be horizontal and 0.85m high. The results of the No-Sky Line assessment show that 37 (90%) rooms achieve values in line with the BRE recommendations. Windows that are sited close to the corners or below the balconies are usually more obstructed and achieve lower levels of both daylight and sky view.

Therefore, it is anticipated that all habitable spaces within the proposed scheme will receive acceptable levels of daylight.

Overall Summary

The introduction of the Spatial Daylight Autonomy (SDA) standard during the advanced design phase of the project meant that the team has coped with the implementation of a new standard in a design that was already well advanced. The design has been validated against multiple design and sustainability criteria and will be an exemplary high-quality place for people to live in. SDA has principally been developed to ensure that students in classrooms

or workers in an office, are not in locations with little or no daylight, and efforts are made to equalise daylight across the working space. This is less of an issue for residential design where there is no expectation or need to have equal daylight levels throughout an apartment, in fact, it could easily be argued that variety in levels of daylight in an apartment is useful, so that some tasks (like computer use for virtual meetings) can be carried out without reflections on the computer screen.

The aim for the Dwyer Road site is to consider general needs housing alongside downsizer apartments. Capacity on site will rely on balancing housing provision alongside associated car parking levels, amenity and landscape and biodiversity aspirations.

All homes enjoy private external amenities in addition to communal residents external amenity. Balconies are always provided near to or in front of living rooms and are accessed by opening glazed doors. They naturally shade the apartment below, which helps to avoid overheating, but it also reduces sunshine and daylight levels while providing safe access to fresh air and sunshine and allows residents to enjoy views.

Designing larger windows risks increasing solar gains and increased overheating which the new BRE Guidelines cautions against. However the design team has increased the opportunity to provide a good level of daylight quality by increasing the window sizes as much as practicable, while confronting the challenges of balancing the overheating risks and energy performance.

Overall, the majority of rooms achieve and exceed the recommendations. The scheme has sought to achieve a balance between these competing factors as well as other planning and design considerations in order to deliver housing which is of a high quality, sustainable and enjoyable. The daylight conditions are, therefore, deemed good for the scheme of this size and nature.

Table 03 - Summary results of the daylight assessment - Proposed design

Analysed rooms	Illuminance Factor		No-sky line	
	Rooms meeting the criteria (no.)	Rooms meeting the criteria (%)	Rooms meeting the criteria (no.)	Rooms meeting the criteria (%)
47	38	81%	43	91%

Table 04 - Summary results of the daylight assessment - Proposed design

Illuminance Factor			
		Rooms meeting the criteria (no.)	Rooms meeting the criteria (%)
Analysed bedrooms	26	22	85%
Analysed Kitchen-living-dining rooms	15	11	73%
Analysed Kitchens	3	2	67%
Analysed Living rooms	3	3	100%

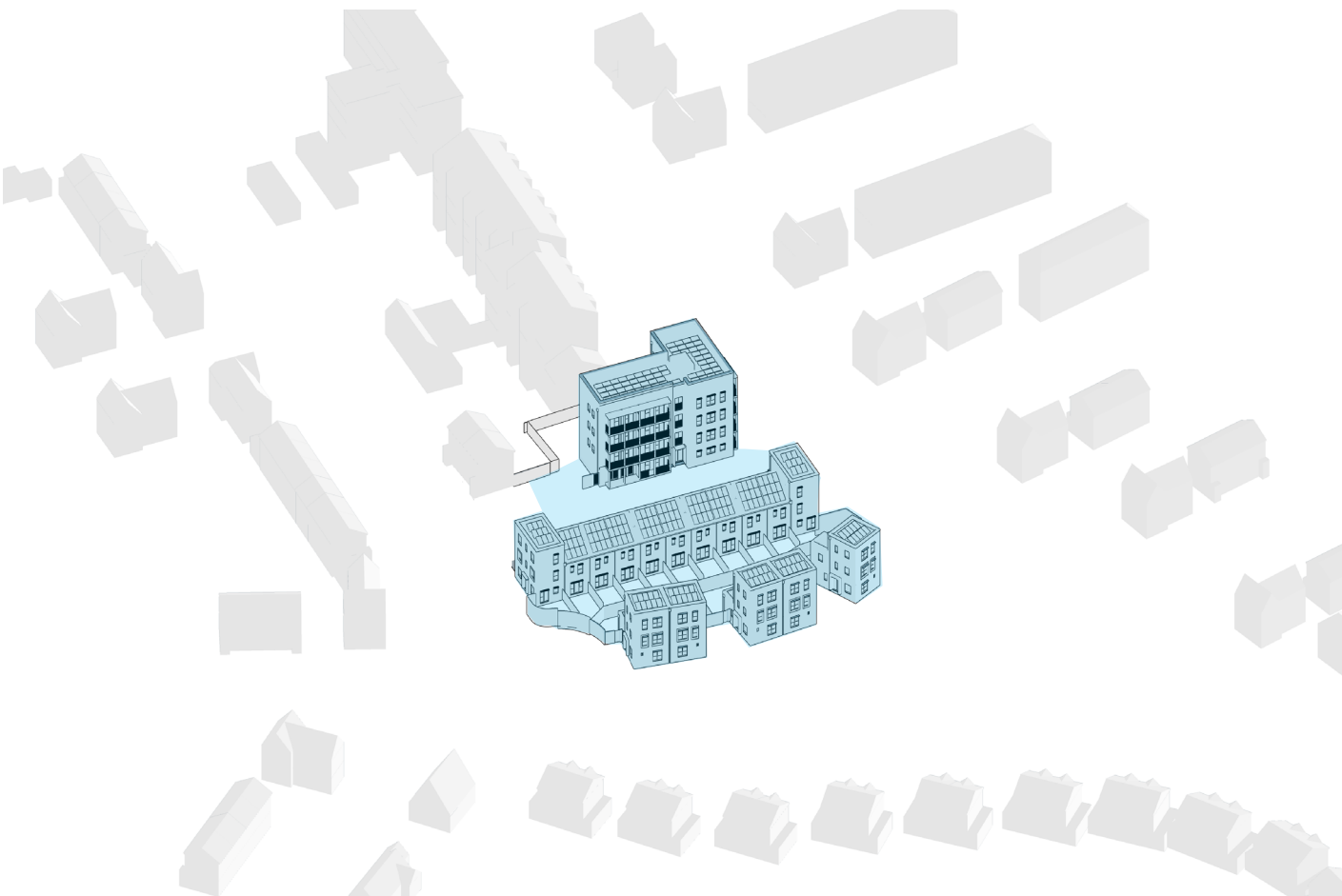


Figure 13 - 3D model of the proposed development and its surroundings

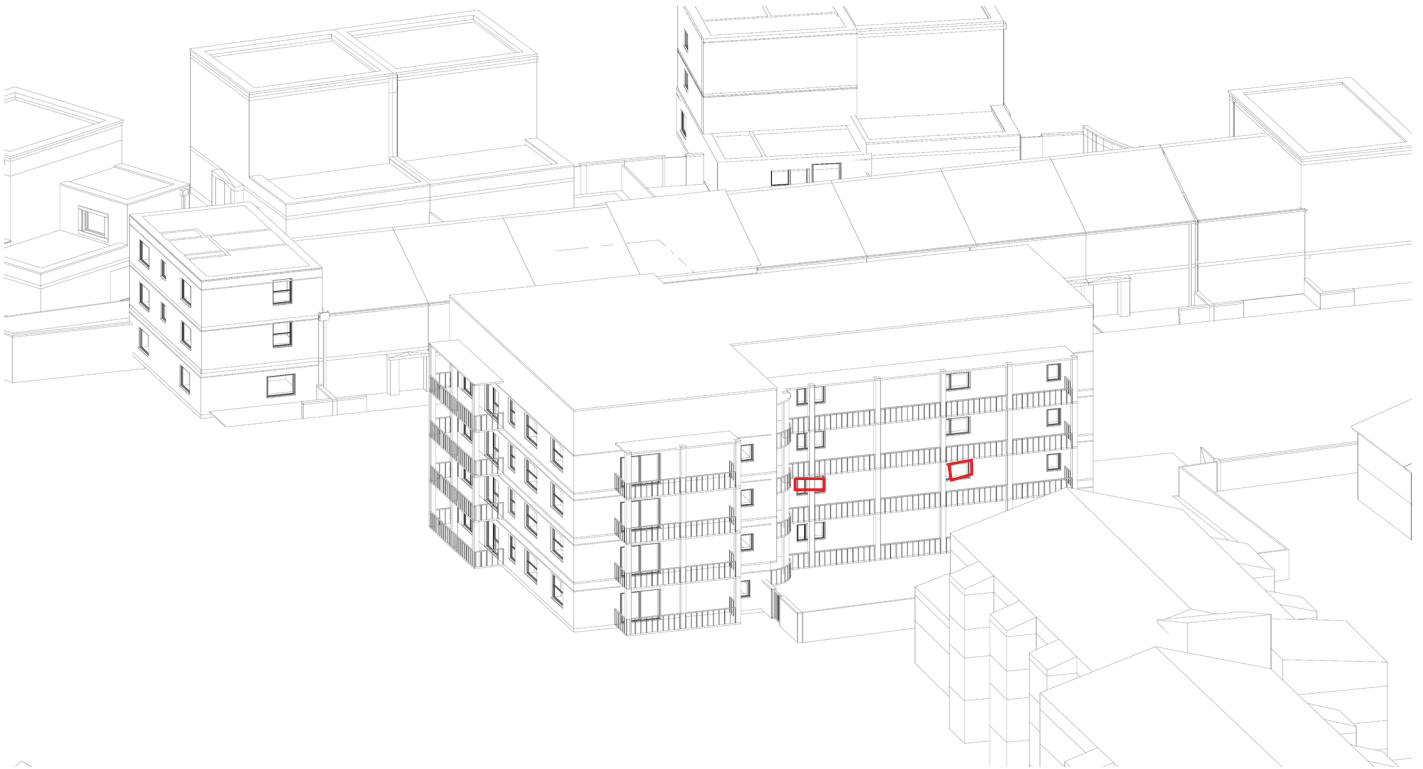


Figure 14 - 3D view - Window design



Key

Figure 15 - Level 1, Apartments - Representative unit - Illuminance (SDA) results ● Rooms not meeting the SDA (Illuminance) criteria)

7.0 Sunlight Assessment

7.1 Impact on existing properties

Sunlight is an important issue to consider for the quality of an internal space. The orientation of windows and the position of a building on a site will have an impact on the amount of sunlight it receives but will also have an effect on the sunlight which neighbouring buildings receive. Unlike daylight, which is non-directional and assumes that light from the sky is uniform, the availability of sunlight is dependent on the orientation of the window or area of ground being assessed relative to the position of the sun.

In accordance with the BRE guide, only windows facing within 90 degrees of due south need to be assessed.

Charles Clore Court was analysed in more details.

A total of 34 windows from the building surrounding the site were assessed for sunlight access. The analysis indicated that 91% of windows satisfied the BRE criteria for annual probable sunlight hours (APSH) and 74% of windows for winter probable sunlight hours (WPSH).

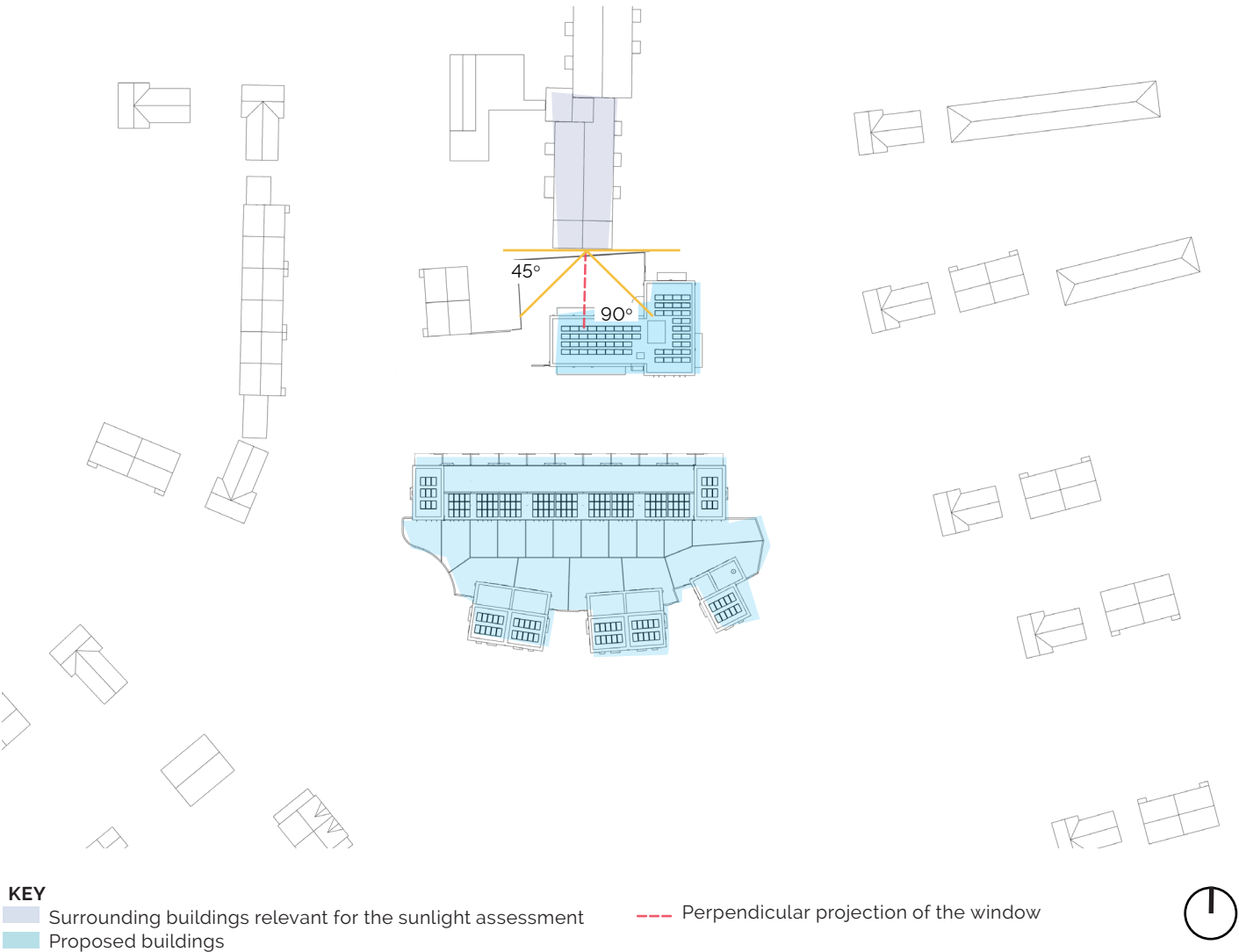


Figure 16 - Site plan indicating the existing buildings tested for the sunlight assessment

Out of 34 windows within 90° due south, 31 achieved Annual sunlight values (APSH) of more than 27%. It is important to mention that most of these windows only present a reduction in annual sunlight compared to the existing condition. The remaining 3 windows fall marginally below the Annual sunlight target and are located in close proximity to the proposed scheme and to the southeast of the emerging building, therefore, it is expected to have fewer hours of sunlight during the day, especially during winter. Similarly, 9 out of 34 assessed windows for Sunlight

are falling below the Winter Sunlight target set by BRE. This was expected as these windows are all located in close proximity to the proposed scheme as well as facing to the east with a result having fewer hours of sunlight over a day. Overall, the proposed development at Dwyer Road is not considered to have any notable impact on sunlight access to windows of surrounding developments. Appendix C shows the detailed results of the analysis.

Table 05 - Detailed results of the Sunlight Assessment - Impact on the surrounding

Property	Number of Rooms Tested	Annual			Winter			Both		
		Rooms that meet BRE Guidelines		No. of Rooms Experiencing Adverse Impacts	Rooms that meet BRE Guidelines		No. of Rooms xperiencing Adverse Impacts	Rooms that meet BRE Guidelines		No. of Rooms xperiencing Adverse Impacts
		No.	%		No.	%		No.	%	
Charles Clore Court	34	31	91%	3	25	74%	9	25	74%	9

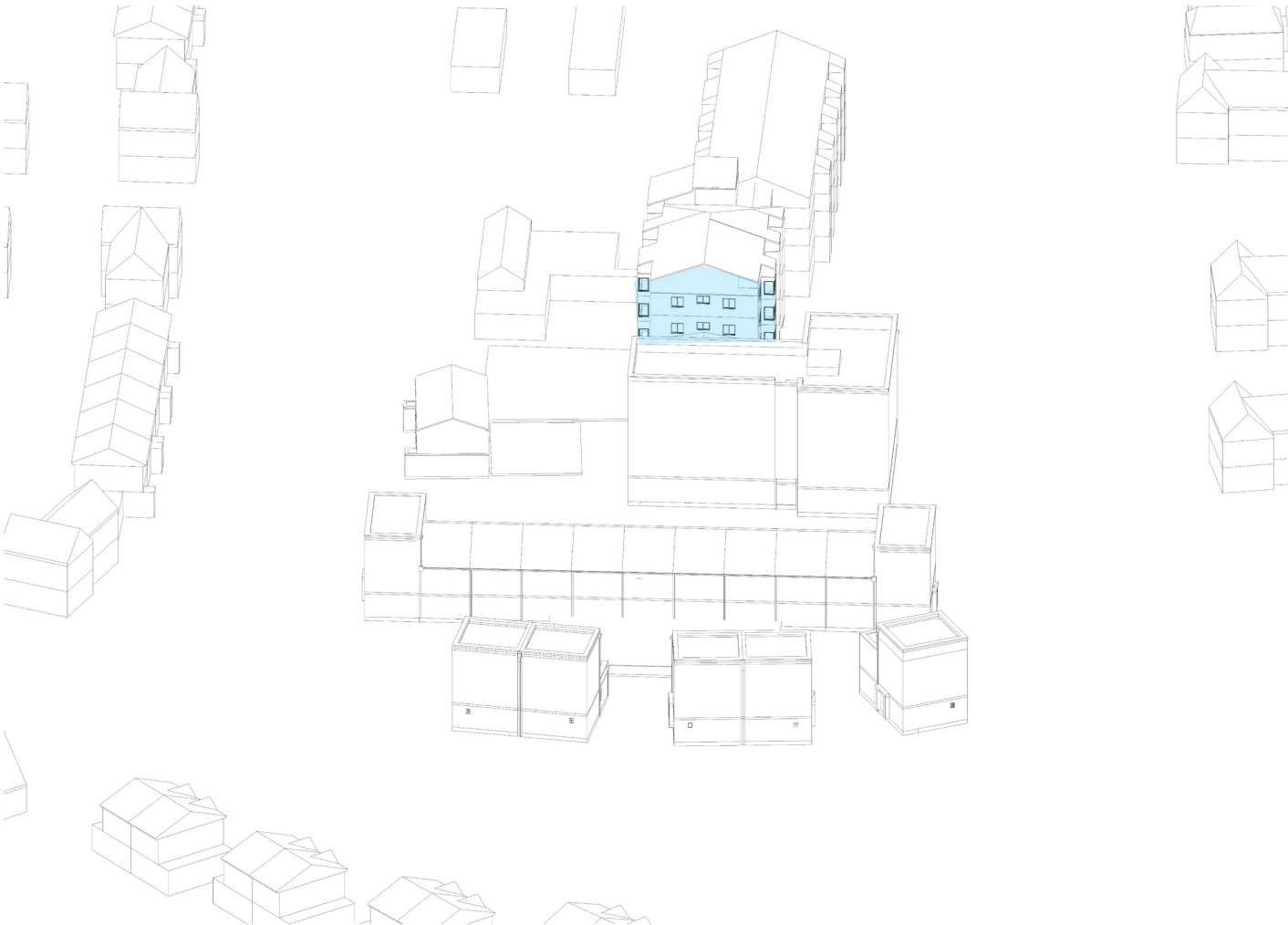


Figure 17 - Charles Clore Court

7.2 Proposed development

In residential spaces, the main requirement for sunlight is in living rooms, where it is valued at any time of day, but especially in the afternoon.
According to the new BRE guide, for a space to be reasonably sunlit:

- At least one main window wall should face within 90° of due south and
- A habitable room, preferably a main living room, can receive a total of at least 1.5 hours of sunlight on 21 March. This is assessed at the inside centre of the window(s); sunlight received by different windows can be added provided they occur at different times and sunlight hours are not double

As suggested in BS EN 17037, If a room has multiple windows, the amount of sunlight received by each can be added together provided they occur at different times and sunlight hours are not double counted.

A total of 13 south-facing living rooms and 36 windows have been assessed against the criteria set out in the BRE guide. The image below indicates these rooms and windows.

The results show that all of the 13 tested living rooms achieve adequate sunlight through the year. The results are deemed acceptable.

Living rooms facing other orientations are not analysed as they fall outside the 90 degree criterion. Lower sunlight values will be achieved on these windows. However, adequate sunlight access will be provided through access to a communal external space as described in the next section of this report.

The design team has carefully considered sunlight provision alongside overheating, noise, energy requirements, and elevation design. The results are deemed to be satisfying.

Detailed results of the analysis can be found in Appendix B3

Table 06 - Summary results of the sunlight assessment

Sunlight Exposure		
South facing living rooms	Rooms meeting the criteria (no.)	Rooms meeting the criteria (%)
13	13	100%

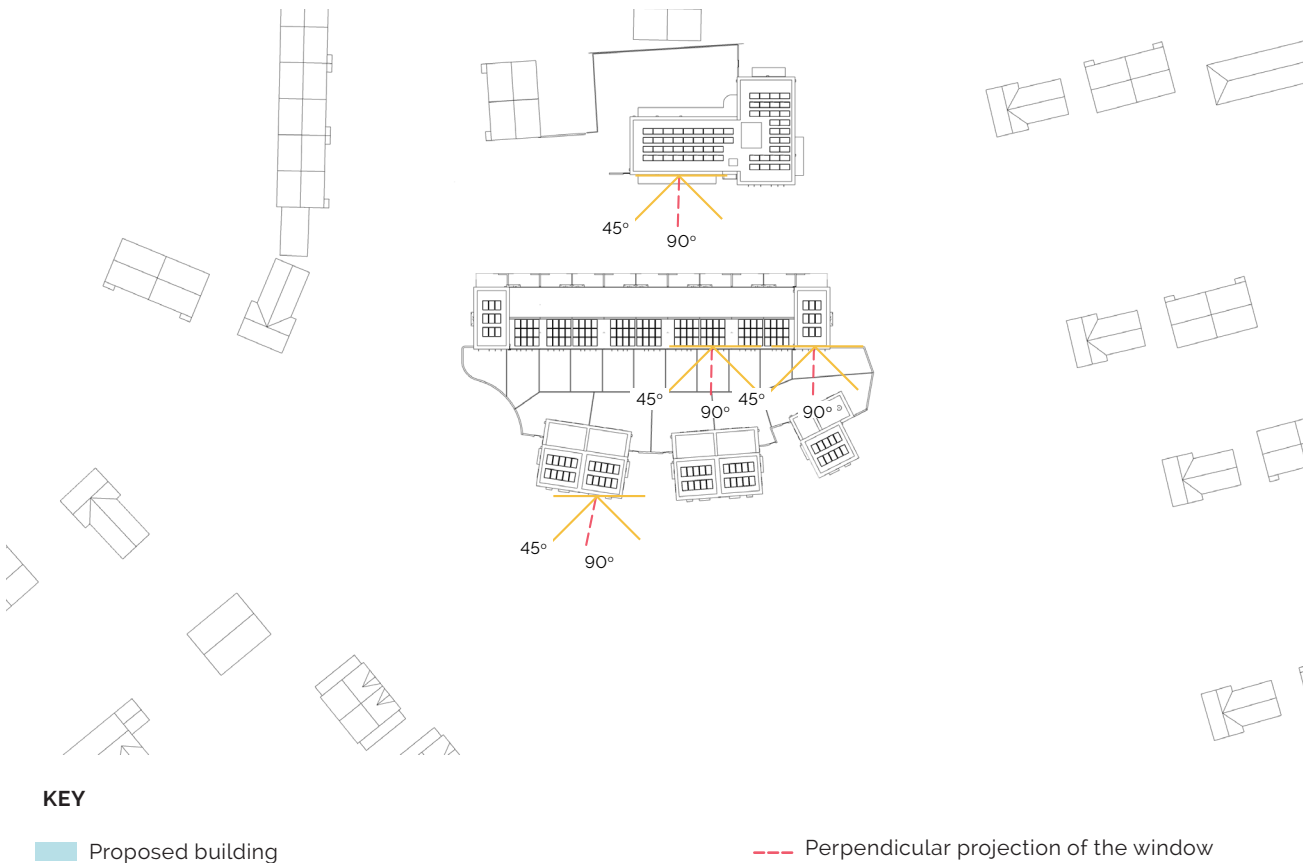


Figure 18 - Site plan indicating the proposed building tested for the sunlight assessment



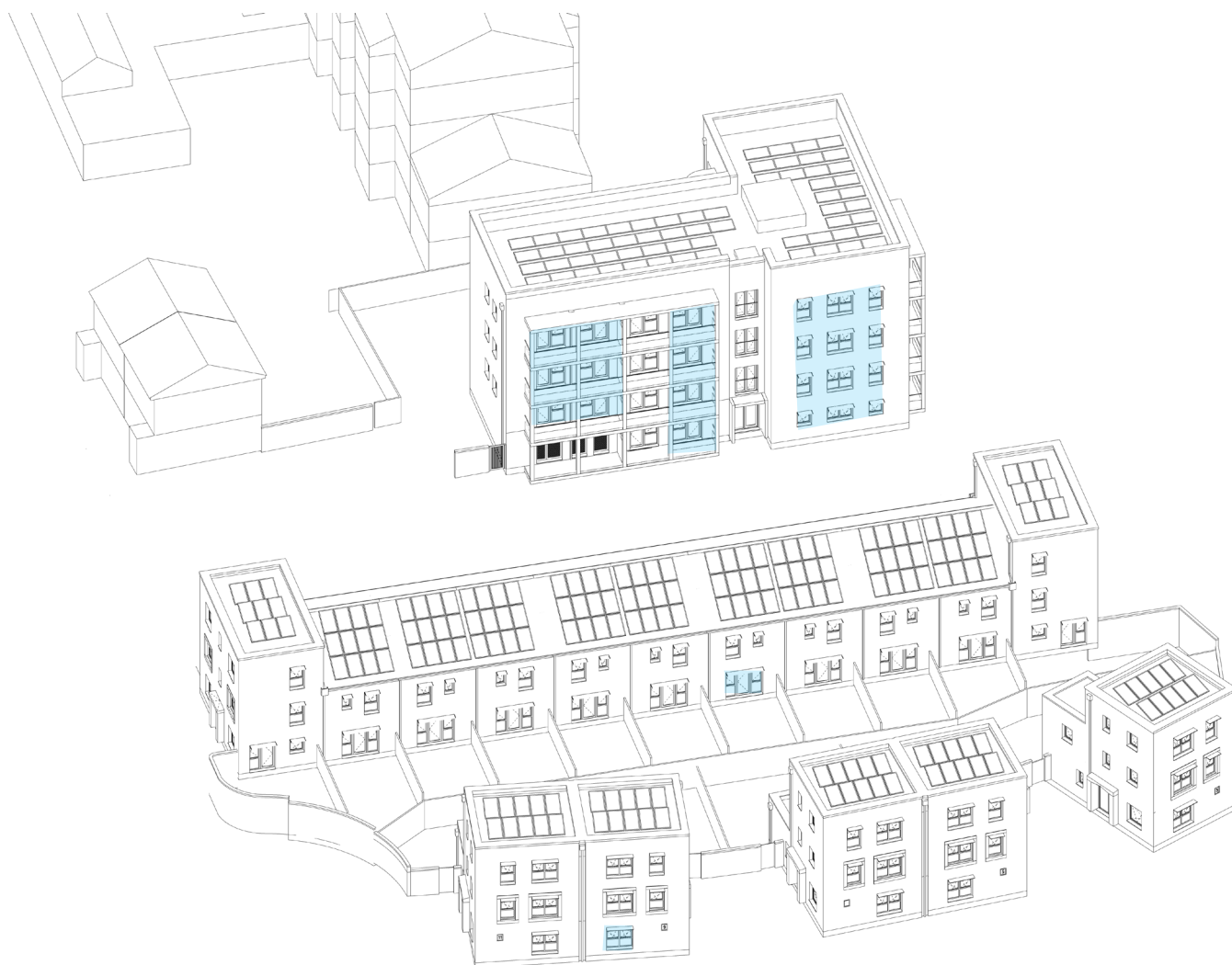


Figure 19 - 3D model of the proposed development, light blue color indicates the living rooms tested with at least one window due to south

8.0 Sun-on-the ground Analysis

8.1 Impact on existing properties

The recommendations set out in the BRE guide explain how to ensure that outdoor spaces are not permanently in shade for a large part of the year. At least 50% of the open spaces should receive 2 hours of sunlight on the equinox (21st March).

According to the BRE guidance, the availability of sunlight should be checked for all open spaces where it will be required. This would normally include:

- Gardens,
- Parks and playing fields,
- Children's playgrounds,
- Sitting out areas such as those between non-domestic buildings and in public squares, and
- Focal points of view such as a group of monuments or fountains.

An analysis was carried out to assess the sunlight availability on 21 March, including a comparison with the existing configuration.

Appendix D presents the shadow range analysis indicating

the time of the day when buildings and external spaces will be in shade.

The sun-on-the ground analysis has been undertaken for these spaces on 21 March as recommended in the BRE guideline.

The results show that all 3 amenity spaces located northeast of the proposed scheme meets the BRE recommendations. The detailed results indicate that the existing amenity spaces will not experience any reductions compared to its former value on 21 March.

The following images present a comparison between the existing and the proposed configurations. The areas in yellow indicate where at least two hours of sunlight are achieved on the 21 March.

It can be concluded that proposed development does not cause any harm to the surrounding amenity spaces and, overall, the results are acceptable.

Table 07 - Sunlight on the ground - Existing properties (21 March)

Space	Area with at least 2 hours of sun (%)		Ratio	Condition
	21 March (Existing)	21 March (Proposed)		
1	100%	100%	1	Pass



Figure 20 - Sunlight on the ground - Existing configuration -The area marked in yellow indicate that the minutes of sunlight on 21 March



Figure 21 - Sunlight on the ground - Proposed configuration - The area marked in yellow indicate that the minutes of sunlight on 21 March

8.2 Assessment of the proposed development

According to the BRE guidance, the availability of sunlight should be checked for all open spaces where it will be required. This would normally include:

- Gardens,
- Parks and playing fields,
- Children's playgrounds,
- Sitting out areas such as those between non-domestic buildings and in public squares, and
- Focal points of view such as a group of monuments or fountains.

In order to be in line with the BRE recommendations, at least 50% of its area should receive direct sunlight for two hours or more on 21 March (Spring Equinox).

An additional test was also conducted on 21 June to assess the sunlight conditions in the summer period when people usually spend longer hours outdoor and are most likely to use these spaces. These spaces would achieve adequate sunlight condition and no significant reduction was found for this period.

A sunlight assessment was carried out for the proposed amenity spaces. Figure 22 shows the location of the assessed spaces. Figure 23 and 24 show in yellow the areas achieving at least 2 hours of sun on the 21 March and 21 June. The results show that out of 17 spaces tested on 21 March, 12 spaces meet or exceed the criteria. 5 private gardens fall below the criteria on 21 March. It should be noted that these spaces achieve adequate sunlight over the summer which compensates the loss of sunlight on 21 March.

Overall, the design maximises sunlight within the communal open space and the private gardens to ensure that future occupants have access to adequate sunlight levels throughout the year. Also, occupants will have access to well sunlit amenity spaces during the summer when the open spaces will be used more often. Therefore, results are deemed acceptable.

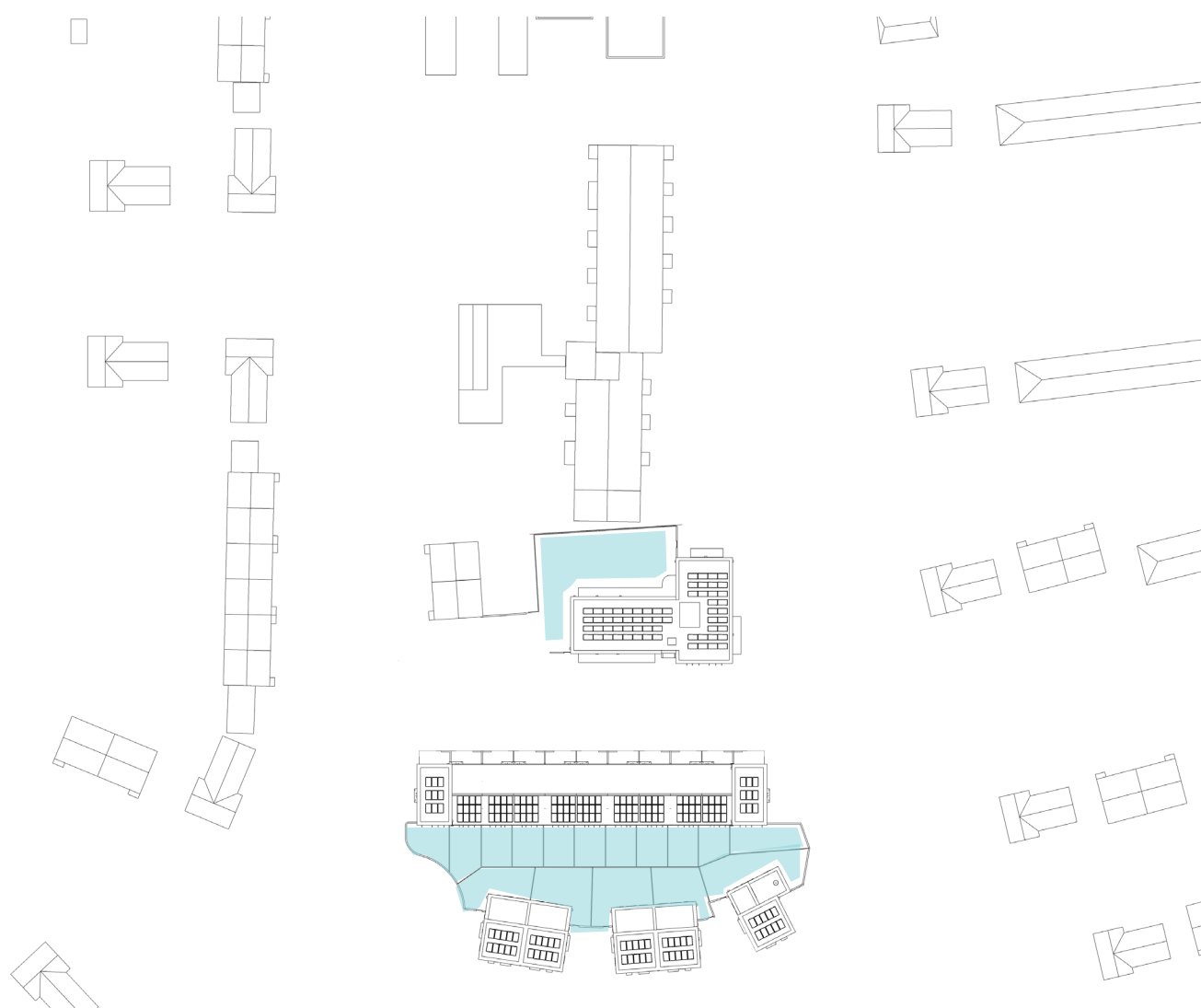


Figure 22 - Site plan identifying the location of the proposed external spaces

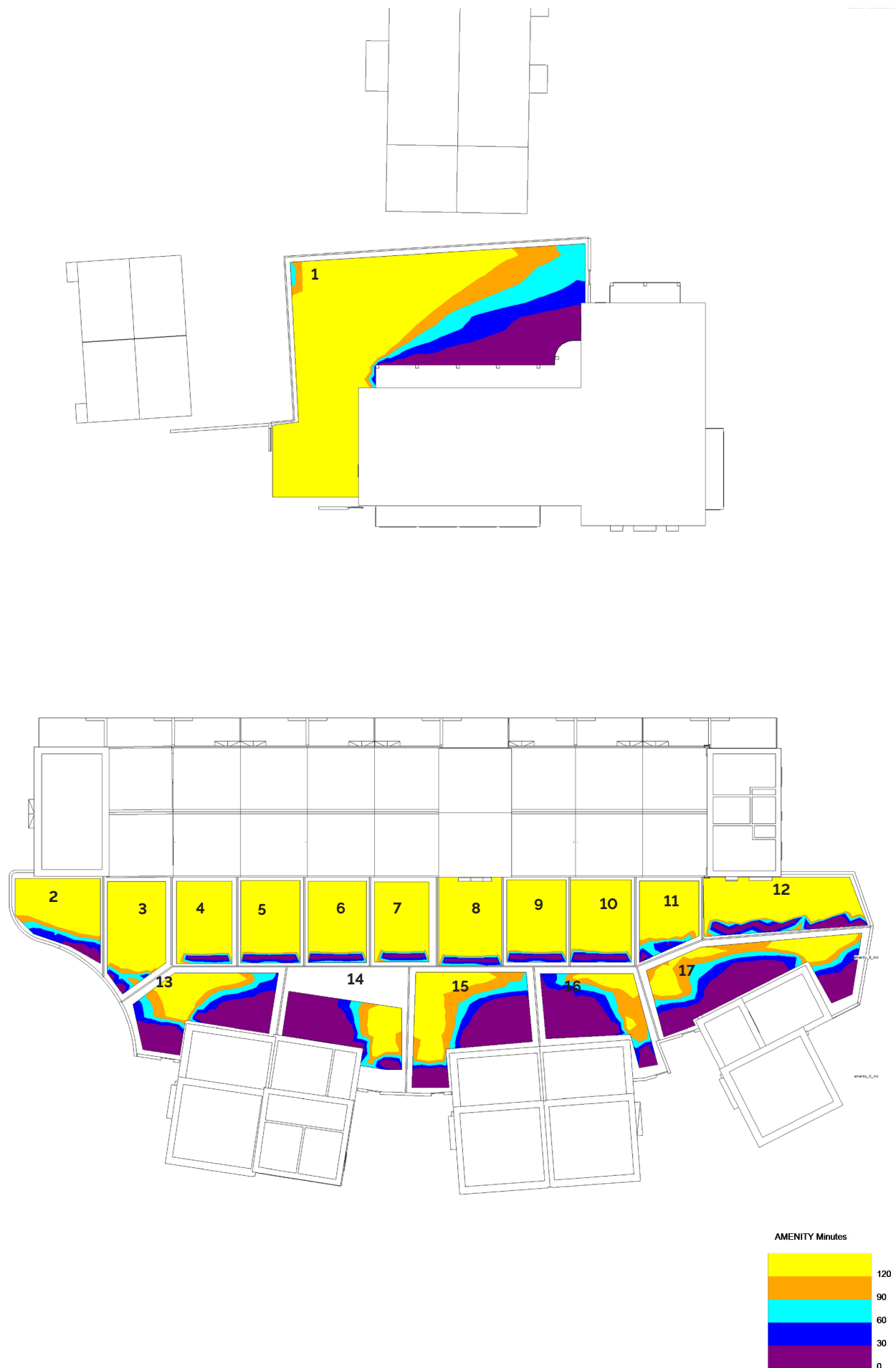


Figure 23 - Sunlight on the ground - 21 March, the areas marked in yellow indicate the minutes of sunlight on the 21st of March

Table O8 - Sunlight on the ground - 21 March - Proposed spaces

	Facade Area	Lit Area Proposed	Lit Area Proposed % with at least 2 hours of sun (%) 21 March	Meet criteria on 21 March	Criteria
1	312.91	170.86	54.61%	Yes	50%
2	34.95	25.74	73.68%	Yes	
3	37.00	31.45	85.00%	Yes	
4	29.7	25.46	85.71%	Yes	
5	31.68	27.15	85.71%	Yes	
6	30.55	25.46	83.33%	Yes	
7	28.16	23.47	83.33%	Yes	
8	36.52	31.30	85.71%	Yes	
9	31.68	27.15	85.71%	Yes	
10	32.34	27.72	85.71%	Yes	
11	26.25	21.00	80.00%	Yes	
12	53.90	38.64	71.70%	Yes	
13	51.63	14.17	27.45%	No	
14	41.44	8.29	20.00%	No	
15	63.95	18.99	29.69%	No	
16	44.05	8.20	18.60%	No	
17	71.06	20.00	28.17%	No	
Average			63.77%	Yes	



Figure 24 - Sunlight on the ground - 21 June, the areas marked in yellow indicate the minutes of sunlight on the 21st of June

Table 09 - Sunlight on the ground - 21 June - Proposed spaces

	Facade Area	Lit Area Proposed	Lit Area Proposed % with at least 2 hours of sun (%) 21 June	Meet criteria on 21 June
1	312.91	274.83	87.83%	Not required
2	34.94	34.03	97.37%	
3	37.01	37.01	100.00%	
4	29.70	29.70	100.00%	
5	31.68	31.68	100.00%	
6	30.55	30.55	100.00%	
7	28.16	28.16	100.00%	
8	36.52	36.52	100.00%	
9	31.68	31.68	100.00%	
10	32.34	32.34	100.00%	
11	26.25	25.37	96.67%	
12	53.89	52.88	98.11%	
13	51.64	47.59	92.16%	
14	41.44	40.52	97.78%	
15	63.95	60.95	95.31%	
16	44.05	43.03	97.67%	
17	71.06	67.06	94.37%	
Average			97.50%	

9.0 Conclusion

A daylight, sunlight and overshadowing analysis has been carried out by HTA Sustainable futures to assess the impact of the new development on the existing surrounding properties as well as the performance of the new residential units within the scheme.

To ensure that this development can be appropriately evaluated against the current planning policies, the analysis has been carried out in accordance with BRE's guide 'Site Layout Planning for Sunlight and Daylight: A Guide to Good Practice', P J Littlefair (2022). According to the BRE guide:

'...the advice given here is not mandatory and this document should not be seen as an instrument of planning policy. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design. In special circumstances the developer or planning authority may wish to use different target values'.

Daylight

Daylight in the surrounding buildings

The impact on the surrounding buildings has been minimised to the largest degree. A total of 61 windows that belong to residential units that are in close proximity and face the proposed development have been assessed.

The results show that 84% of the analysed windows achieved VSC levels in line with the BRE recommendations. In summary

- 51 out of 61 windows achieved VSCs more than 27% or their reduction is no more than 20% of their former value
- 6 out of the remaining 10 windows achieved VSCs higher than 20%, which is considered to be a satisfactory level of daylight in urban environments..
- The remaining 4 windows are located in the ground and first floor of Charles Court which is in a close proximity with the proposed scheme. It is also important to mention that given the low-rise nature of the existing structures on site where there is a more than a 20% reduction in VSC, does not mean that the level of daylight will be unacceptable but, rather, that there may be a noticeable change in daylight levels to the occupants. More specifically one window out of the 4 above windows, which is located to the ground floor of Charles court and facing the new development, falls into this category.

The design team increased the opportunities to ensure that the retained values of the units of the existing building are appropriate to its context.

Overall, the proposed development daylight is not

considered to have any important daylight impact on the surrounding buildings of the site, therefore the results are deemed good for the scheme.

Daylight in the proposed development

The design of the proposed development ensures that the proposed dwellings and outdoor spaces receive good daylight levels. A total of 47 units in the development were assessed against the new BRE criteria. Overall, 81% of the dwellings meet or exceed the SDA criterion, while 91% of them meet the requirement for sky-view.

Overall, the proposed development daylight is not considered to have any notable risks in terms of daylight, therefore the daylight levels are deemed good for the scheme.

Sunlight

Sunlight in the surrounding buildings

The impact on the provision of sunlight in the south facing rooms of the surrounding buildings will not be significantly affected, as 91% of the rooms next to the new development within 90 degrees of due south achieve the recommended values for the Annual Probable Sunlight Hours (APSH) and 74% of them pass the Winter Probable Sunlight Hours (WPSH) test.

The reductions to the sunlight values are deemed acceptable for a scheme in a city environment and in making effective use of land.

Sunlight in the proposed development

All out of the 13 assessed living rooms with at least one of their windows south, achieved met the sunlight exposure targets. The results are deemed to be good.

Overall, the results are deemed good for the scheme.

Overshadowing

Sunlight on the ground in the existing spaces

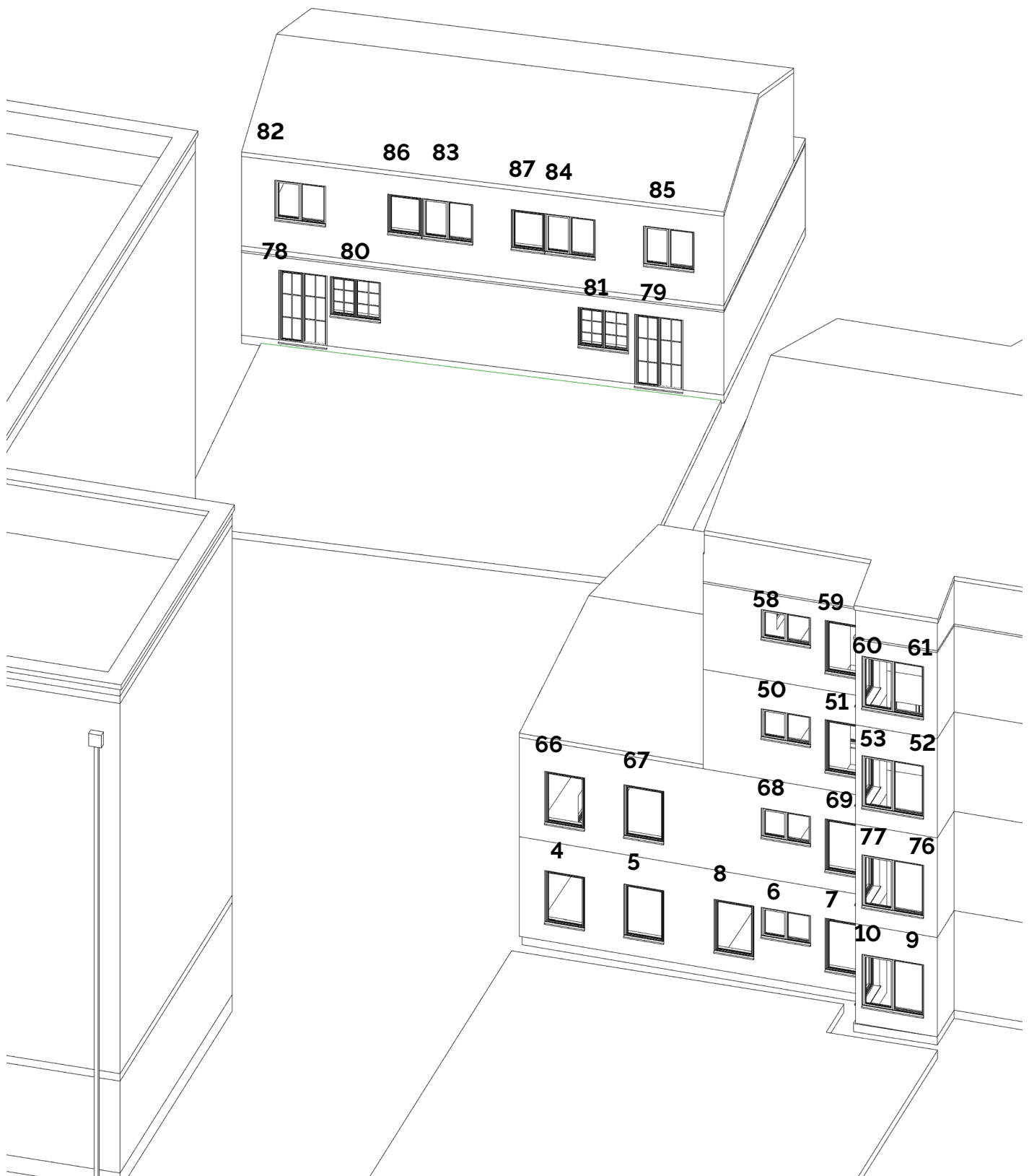
A review of the site plan showed that there is are 3 amenities located to the north of the proposed development that it may be affected. A Solar Access Analysis was undertaken on these amenity areas for the full 24 hours on 21 March as set out by the BRE. The analysis was carried out for both configurations, existing and proposed. The spaces will achieve sunlight availability in line with the BRE criteria. The results show that there is no reduction compared to the former values.

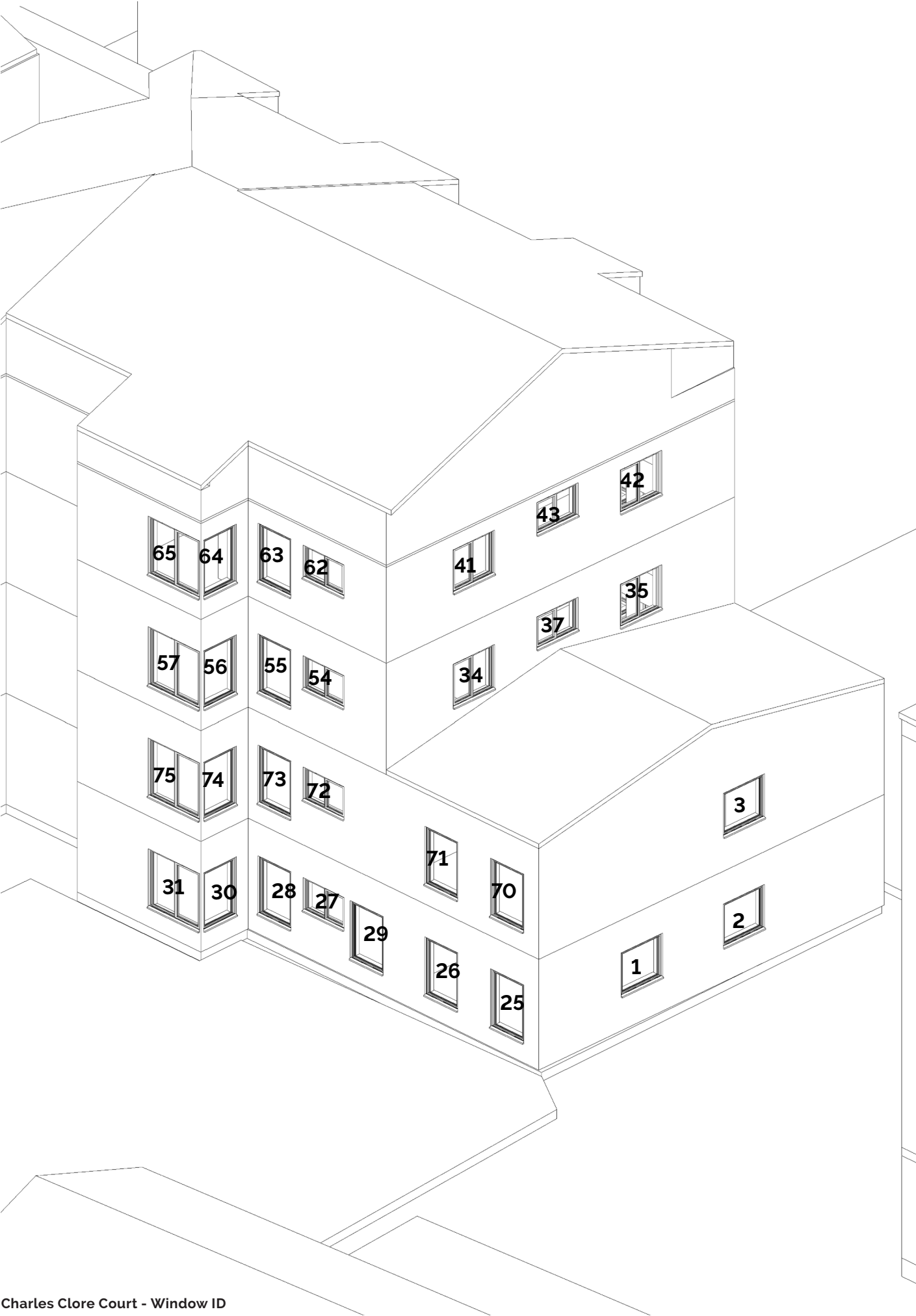
Sunlight on the ground - Proposed spaces

The overshadowing assessment show that 12 out of the 17 in total assessed amenity spaces complies with the requirements described in the BRE guidelines on 21 March. The remaining 5 private gardens are falling below the target. However, it is important to note that all the amenity spaces are well sunlit over the summer (21st of June) when the spaces are more likely to be used. The sunlight provision in private gardens and the open space will also compensate for the loss of direct sun within the living rooms not facing south.

Overall, it could be concluded that the proposed development will offer adequate levels of daylight and sunlight to future occupants, the living spaces and to the external amenity area throughout the year.

Appendix A -Daylight Results of the daylight analysis - Impact Assessment





Charles Clore Court - Window ID

Appendix A1 -Daylight Assessment results : Impact on the surrounding buildings

Property	Number of Windows Tested	Windows that meet BRE Guidelines		Windows that experience gains beyond the consented baseline		VSC Windows No. of Windows Experiencing Adverse Impacts		
		No.	%	No.	%	20-29.99% loss (minor adverse losses)	30-39.99% loss (moderate adverse losses)	>40% loss (substantial losses)
B1	61	51	84%	0	0	5	2	3
Total	61	51	84%	0	0%	5	2	3

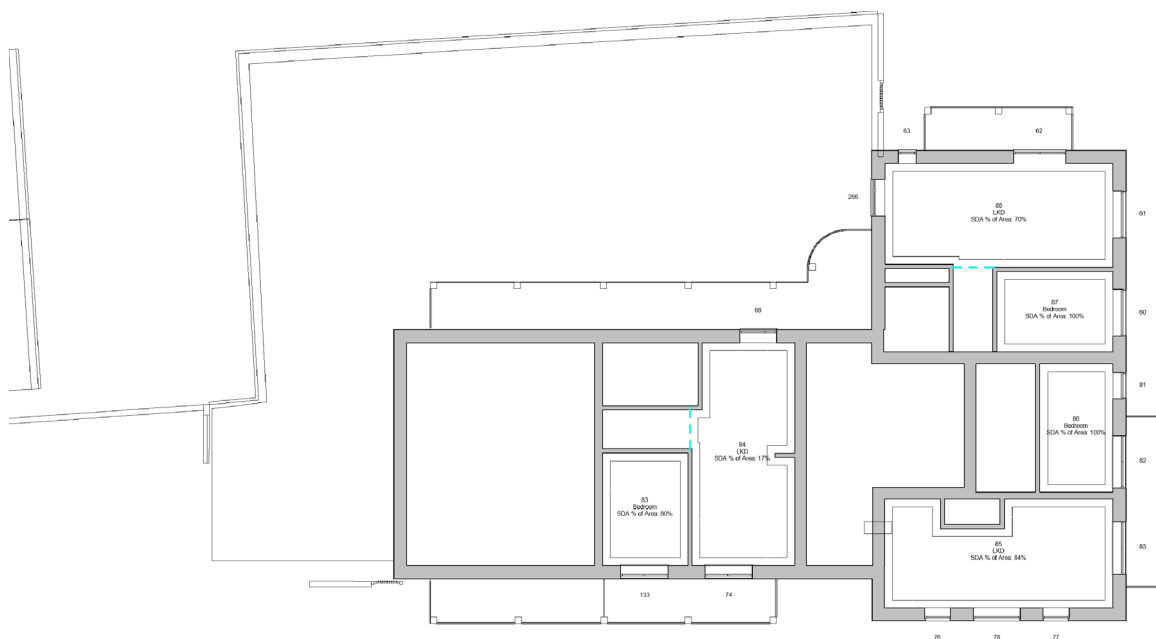
Project Name: RBC-DRR_HTA-S_Dwyer Road_impact assessment_230313_
 Project No.: 1234
 Report Title: Daylight & Sunlight Analysis - Neighbour
 Date of Analysis: 15/03/2023

Floor Ref.	Window Ref.	VSC	Pr/Ex	Meets BRE Criteria	Window Orientation	Annual	Pr/Ex	Meets BRE Criteria	Winter	Pr/Ex	Meets BRE Criteria
Dwyer Road											
Level 0 Charles Court	1	Existing 38.00 Proposed 20.10	0.53	NO	181°	66.00 40.00	0.61	YES	25.00 7.00	0.28	YES
	2	Existing 38.15 Proposed 17.39	0.46	NO	181°	67.00 32.00	0.48	YES	26.00 5.00	0.19	YES
	4	Existing 37.40 Proposed 28.64	0.77	YES	91°	35.00 19.00	0.54	NO	7.00 2.00	0.29	NO
	5	Existing 37.22 Proposed 30.39	0.82	YES	91°	35.00 23.00	0.66	NO	7.00 2.00	0.29	NO
	6	Existing 34.98 Proposed 30.69	0.88	YES	91°	33.00 26.00	0.79	YES	9.00 3.00	0.33	NO
	7	Existing 27.76 Proposed 24.13	0.87	YES	91°	34.00 29.00	0.85	YES	7.00 4.00	0.57	NO
	8	Existing 36.42 Proposed 31.30	0.86	YES	91°	35.00 28.00	0.80	YES	7.00 3.00	0.43	NO
	9	Existing 21.91 Proposed 13.30	0.61	NO	180°	42.00 32.00	0.76	YES	13.00 4.00	0.31	NO
	10	Existing 37.42 Proposed 34.70	0.93	YES	91°	44.00 35.00	0.80	YES	15.00 6.00	0.40	YES
	25	Existing 35.35 Proposed 34.97	0.99	YES	270°N		*North	*North		*North	*North
	26	Existing 35.20 Proposed 34.87	0.99	YES	270°N		*North	*North		*North	*North
	27	Existing 33.24 Proposed 32.99	0.99	YES	270°N		*North	*North		*North	*North
	28	Existing 26.82 Proposed 26.57	0.99	YES	270°N		*North	*North		*North	*North
	29	Existing 34.51 Proposed 34.21	0.99	YES	270°N		*North	*North		*North	*North
	30	Existing 21.06 Proposed 19.30	0.92	YES	180°	39.00 38.00	0.97	YES	12.00 11.00	0.92	YES
	31	Existing 35.49 Proposed 35.31	0.99	YES	270°N		*North	*North		*North	*North
	78	Existing 35.44 Proposed 25.81	0.73	NO	86°N		*North	*North		*North	*North
	79	Existing 32.75 Proposed 25.87	0.79	NO	86°N		*North	*North		*North	*North
	80	Existing 35.38 Proposed 26.39	0.75	NO	86°N		*North	*North		*North	*North
	81	Existing 33.63 Proposed 26.53	0.79	NO	86°N		*North	*North		*North	*North
Level 1_141 Appleford Rd	82	Existing 36.85 Proposed 29.04	0.79	YES	86°N		*North	*North		*North	*North
	83	Existing 36.20 Proposed 29.29	0.81	YES	86°N		*North	*North		*North	*North
	84	Existing 35.54 Proposed 29.48	0.83	YES	86°N		*North	*North		*North	*North
	85	Existing 34.87 Proposed 29.47	0.85	YES	86°N		*North	*North		*North	*North
	86	Existing 36.41 Proposed 29.24	0.80	YES	86°N		*North	*North		*North	*North
	87	Existing 35.78 Proposed 29.41	0.82	YES	86°N		*North	*North		*North	*North
	3	Existing 38.92 Proposed 21.05	0.54	NO	181°	67.00 42.00	0.63	YES	26.00 5.00	0.19	YES

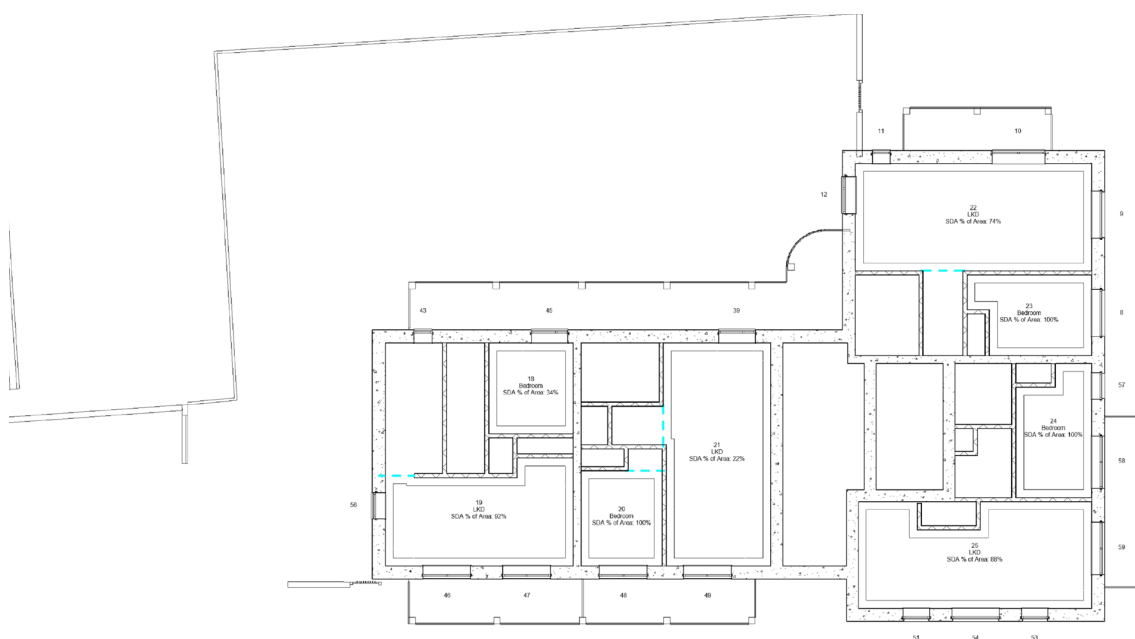
Project Name: RBC-DRR_HTA-S_Dwyer Road_impact assessment_230313_ Project No.: 1234 Report Title: Daylight & Sunlight Analysis - Neighbour Date of Analysis: 15/03/2023												
Floor Ref.	Window Ref.		VSC	Pr/Ex	Meets BRE Criteria	Window Orientation	Annual	Pr/Ex	Meets BRE Criteria	Winter	Pr/Ex	Meets BRE Criteria
Level 1_Charles court	66	Existing	38.22	0.80	YES	91°	35.00	0.63	NO	7.00	0.29	NO
		Proposed	30.42				22.00			2.00		
	67	Existing	38.04	0.84	YES	91°	35.00	0.74	YES	7.00	0.29	NO
		Proposed	32.11				26.00			2.00		
	68	Existing	35.77	0.90	YES	91°	33.00	0.82	YES	9.00	0.33	NO
		Proposed	32.21				27.00			3.00		
	69	Existing	28.36	0.89	YES	91°	34.00	0.91	YES	7.00	0.57	YES
		Proposed	25.37				31.00			4.00		
	70	Existing	37.56	0.99	YES	270°N		*North	*North		*North	*North
		Proposed	37.31									
	71	Existing	37.37	0.99	YES	270°N		*North	*North		*North	*North
		Proposed	37.15									
	72	Existing	35.22	1.00	YES	270°N		*North	*North		*North	*North
		Proposed	35.05									
Level 2_Charles Court	73	Existing	28.33	0.99	YES	270°N		*North	*North		*North	*North
		Proposed	28.16									
	74	Existing	22.80	0.93	YES	180°	43.00	0.98	YES	16.00	0.94	YES
		Proposed	21.17				42.00			15.00		
	75	Existing	37.98	1.00	YES	270°N		*North	*North		*North	*North
		Proposed	37.86									
	76	Existing	22.98	0.68	NO	180°	45.00	0.82	YES	16.00	0.50	YES
		Proposed	15.61				37.00			8.00		
	77	Existing	38.26	0.94	YES	91°	44.00	0.84	YES	15.00	0.53	YES
		Proposed	36.04				37.00			8.00		
	34	Existing	39.40	0.81	YES	181°	67.00	0.90	YES	26.00	0.73	YES
		Proposed	31.91				60.00			19.00		
	35	Existing	39.41	0.76	YES	181°	67.00	0.85	YES	26.00	0.62	YES
		Proposed	29.85				57.00			16.00		
Level 3_Charles court	37	Existing	39.44	0.79	YES	181°	55.00	0.84	YES	26.00	0.65	YES
		Proposed	31.28				46.00			17.00		
	50	Existing	36.57	0.93	YES	91°	33.00	0.91	YES	9.00	0.67	YES
		Proposed	33.94				30.00			6.00		
	51	Existing	28.93	0.92	YES	91°	34.00	0.94	YES	7.00	0.71	YES
		Proposed	26.70				32.00			5.00		
	52	Existing	23.97	0.76	NO	180°	45.00	0.89	YES	16.00	0.69	YES
		Proposed	18.23				40.00			11.00		
	53	Existing	39.05	0.96	YES	91°	44.00	0.91	YES	15.00	0.73	YES
		Proposed	37.41				40.00			11.00		
	54	Existing	36.55	1.00	YES	270°N		*North	*North		*North	*North
		Proposed	36.47									
	55	Existing	29.42	1.00	YES	270°N		*North	*North		*North	*North
		Proposed	29.34									
	56	Existing	24.21	0.94	YES	180°	44.00	1.00	YES	17.00	1.00	YES
		Proposed	22.82				44.00			17.00		
	57	Existing	39.29	1.00	YES	270°N		*North	*North		*North	*North
		Proposed	39.23									
	41	Existing	39.48	0.89	YES	181°	67.00	0.99	YES	26.00	0.96	YES
		Proposed	35.28				66.00			25.00		
	42	Existing	39.52	0.86	YES	181°	67.00	0.97	YES	26.00	0.92	YES
		Proposed	34.05				65.00			24.00		
	43	Existing	39.49	0.89	YES	181°	55.00	0.98	YES	26.00	0.96	YES
		Proposed	35.04				54.00			25.00		
	58	Existing	37.58	0.96	YES	91°	33.00	1.00	YES	9.00	1.00	YES
		Proposed	36.04				33.00			9.00		
	59	Existing	29.49	0.95	YES	91°	34.00	1.00	YES	7.00	1.00	YES
		Proposed	28.15				34.00			7.00		
	60	Existing	25.52	0.87	YES	180°	47.00	0.98	YES	16.00	0.94	YES

Floor Ref.	Window Ref.	VSC	Pr/Ex	Meets BRE Criteria	Window Orientation	Annual	Pr/Ex	Meets BRE Criteria	Winter	Pr/Ex	Meets BRE Criteria	
Court	61	Proposed	22.09	0.98	YES	91°	46.00	0.98	YES	15.00	0.93	YES
		Existing	39.47				44.00			15.00		
	62	Proposed	38.49	1.00	YES	270°N	*North	*North	*North	*North		
		Existing	37.61								43.00	14.00
	63	Proposed	37.60	1.00	YES	270°N	*North	*North	*North	*North		
		Existing	30.19								30.18	
	64	Proposed	30.18	0.97	YES	180°	48.00	1.00	YES	17.00	1.00	YES
		Existing	25.85									
	65	Proposed	25.16	1.00	YES	270°N	*North	*North	*North	*North		
		Existing	39.62								39.62	

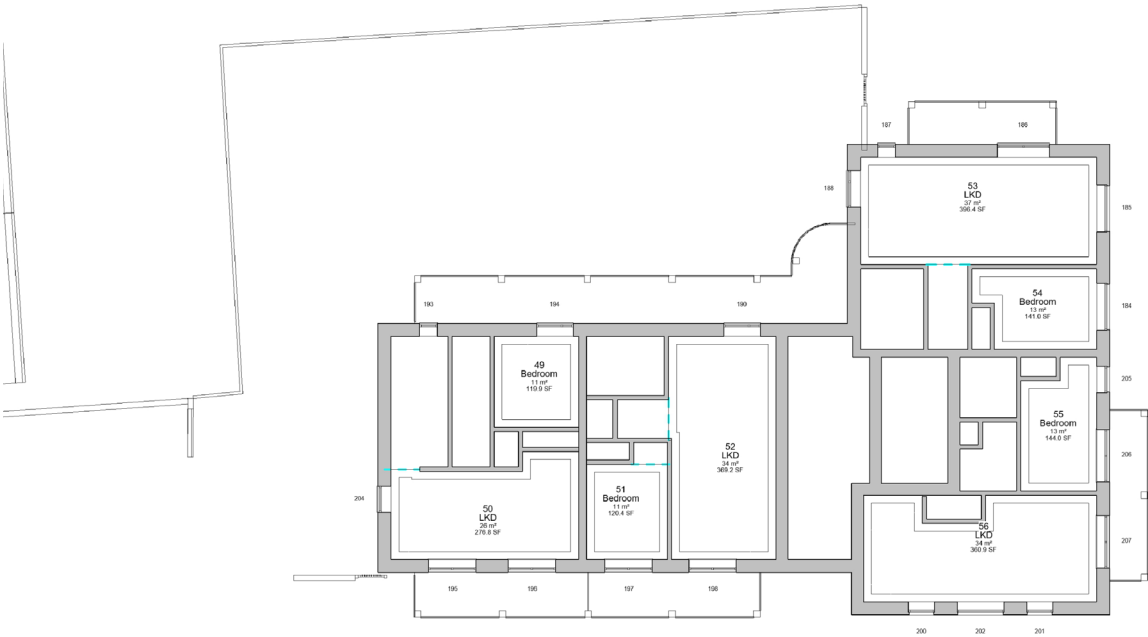
Appendix B -Detailed results of the daylight analysis - Proposed Development



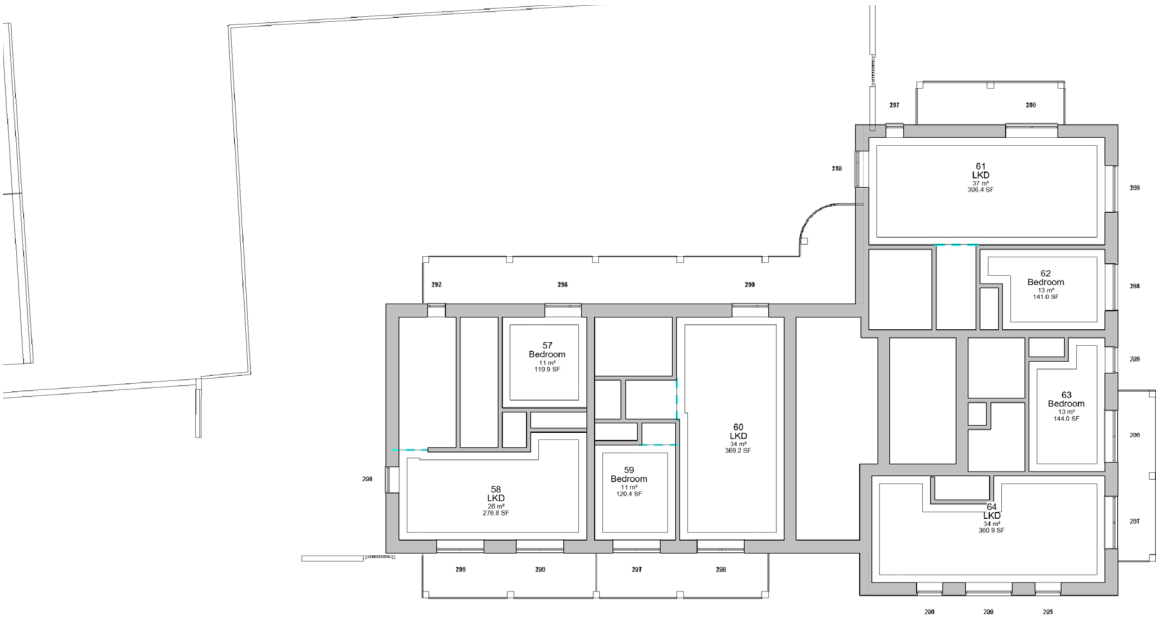
Level 0 - Flats



Level 1 - Flats



Level 2 - Flats



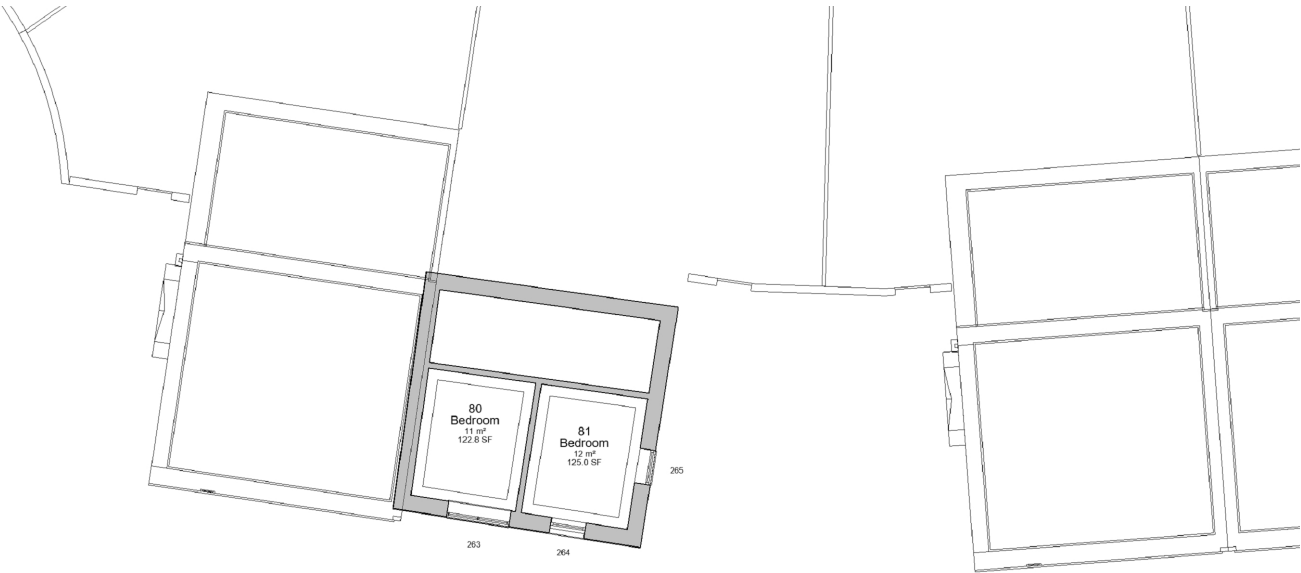
Level 3 - Flats



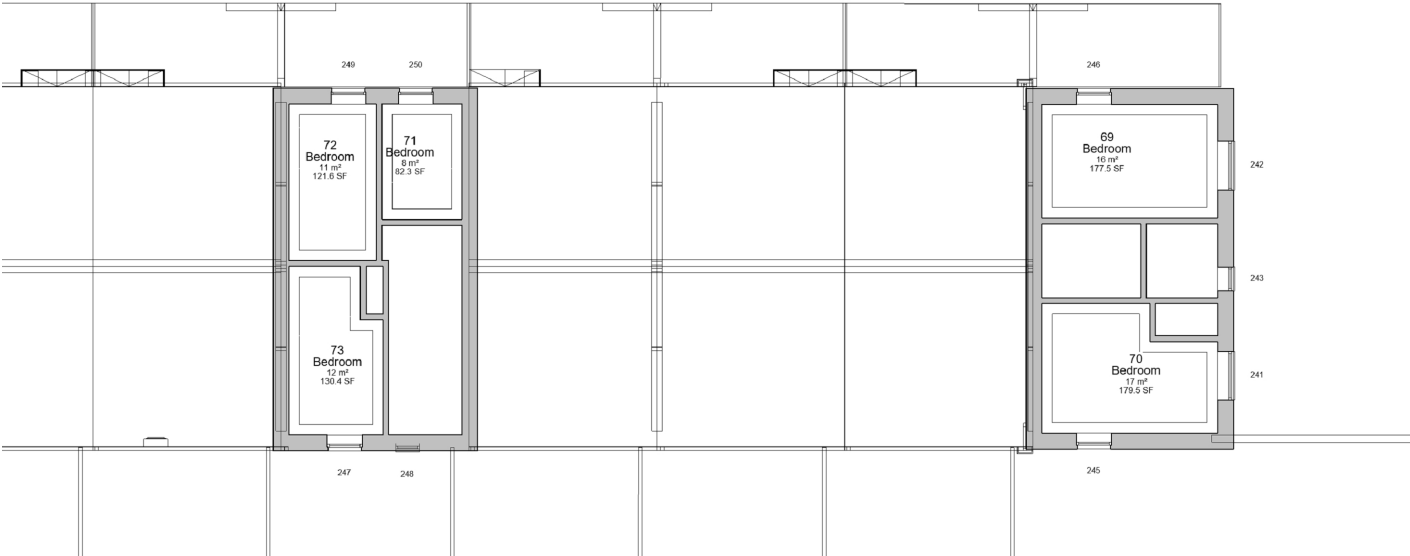
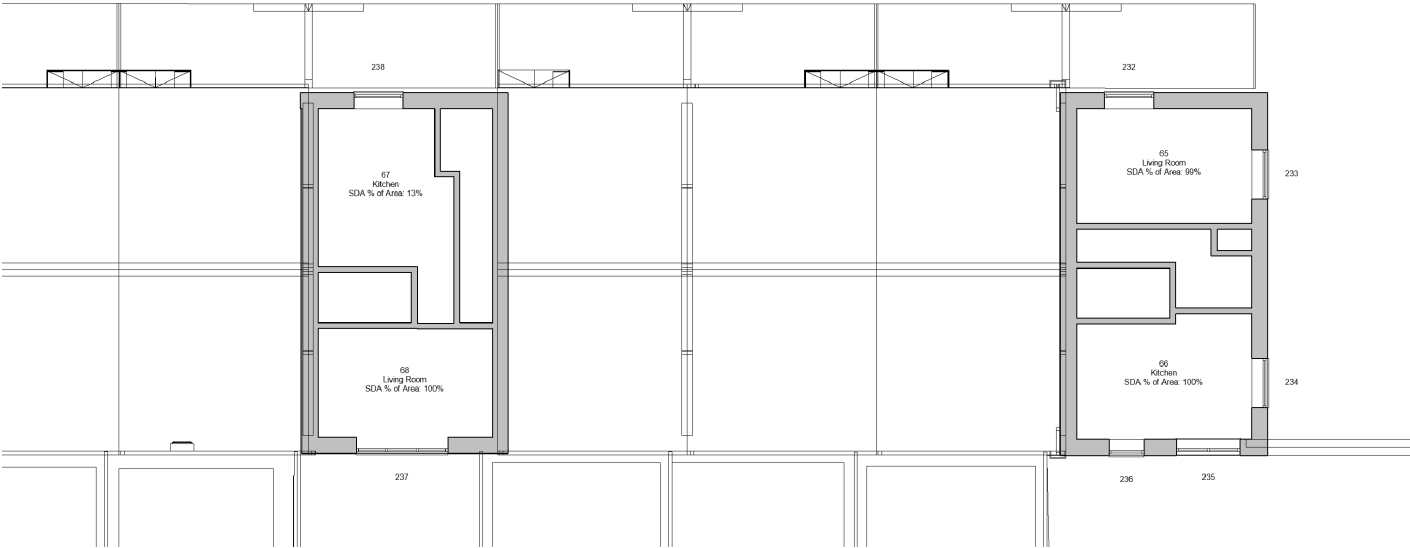
Level 0 - Houses

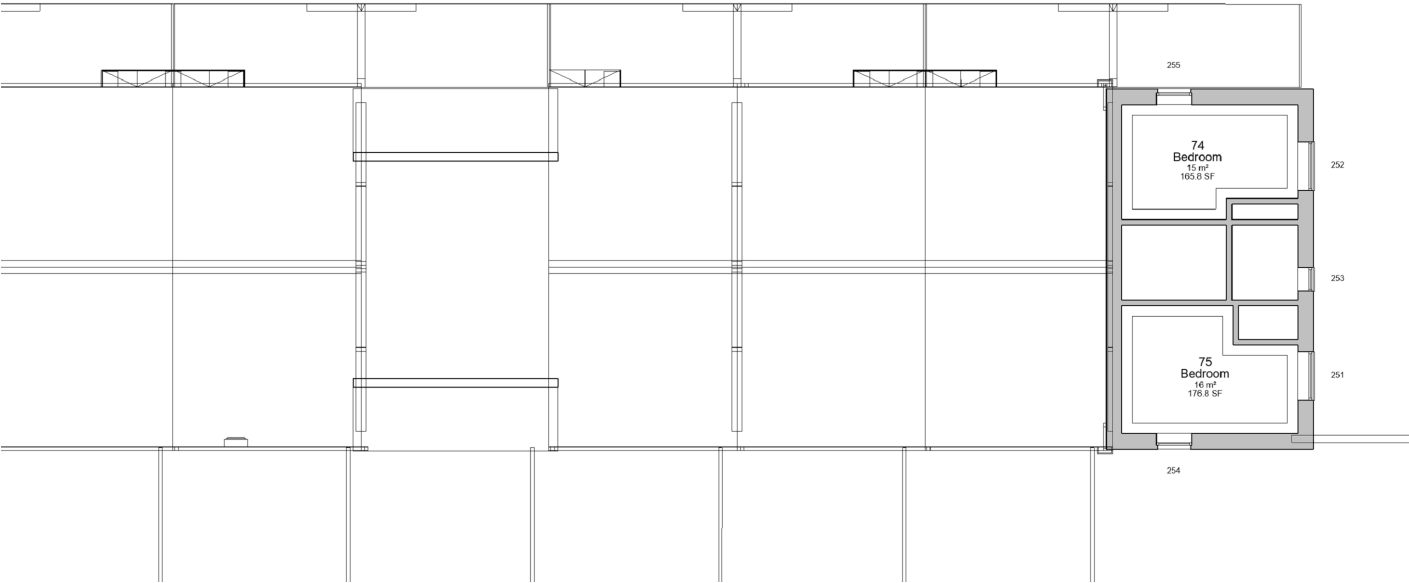


Level 1 - Houses



Level 2 - Houses





Level 2 - Houses

Appendix B1 -Detailed results of the daylight analysis - Proposed Development (Illuminance Factor)

Property	Number of Rooms Tested	Rooms satisfying Criteria		Rooms not satisfying Criteria
		No.	%	
Dwyer Road	47	38	81%	9
Total	47	38	81%	9

Project Name: RBC-DRR_HTA-S_Dwyer Road_Proposed Assessment_230323_versionnew Project No.: 1234 Report Title: SDA BS En17037 Analysis - Proposed Scheme Date of Analysis: 27/03/2023												
								Criteria				
Floor Ref	Room Ref	Room Use	Room Area m2	Effective Area	Median Lux	Area Meeting Req Lux	% of Area Meeting Req Lux	Req Lux	Req % of Effective Area	Req % of Daylight Hours	Daylight Hours	Meets Criteria
Dwyer road												
Level 0 Houses	76	Kitchen	17.49	12.82	224	7.44	58%	200	50%	50%	4380	YES
	77	Living Room	23.35	17.68	340	17.68	100%	150	50%	50%	4380	YES
Level 0 Middle terrace houses	65	Living Room	16.33	11.73	287	11.64	99%	150	50%	50%	4380	YES
	66	Kitchen	17.08	12.29	457	12.29	100%	200	50%	50%	4380	YES
	67	Kitchen	16.36	11.70	54	1.52	13%	200	50%	50%	4380	NO
	68	Living Room	15.41	10.92	323	10.92	100%	150	50%	50%	4380	YES
Level 0 Apartments	83	Bedroom	13.98	9.81	175	7.81	80%	100	50%	50%	4380	YES
	84	LKD	32.24	24.65	91	4.18	17%	200	50%	50%	4380	NO
	85	LKD	33.40	25.36	380	21.25	84%	200	50%	50%	4380	YES
	86	Bedroom	13.65	9.40	359	9.40	100%	100	50%	50%	4380	YES
	87	Bedroom	13.59	9.45	298	9.45	100%	100	50%	50%	4380	YES
	88	LKD	34.11	26.88	287	18.73	70%	200	50%	50%	4380	YES
Level 1 Houses	78	Bedroom	11.14	7.47	373	7.47	100%	100	50%	50%	4380	YES
	79	Bedroom	11.77	8.00	382	8.00	100%	100	50%	50%	4380	YES
Level 1 Middle terrace houses	69	Bedroom	16.49	11.86	305	11.86	100%	100	50%	50%	4380	YES
	70	Bedroom	16.67	11.77	368	11.77	100%	100	50%	50%	4380	YES
	71	Bedroom	7.65	4.64	140	3.09	67%	100	50%	50%	4380	YES
	72	Bedroom	11.30	7.45	75	2.96	40%	100	50%	50%	4380	NO
	73	Bedroom	12.11	7.94	159	5.69	72%	100	50%	50%	4380	YES
Level 1 Apartments	18	Bedroom	11.13	7.49	72	2.58	34%	100	50%	50%	4380	NO
	19	LKD	25.72	19.27	404	17.64	92%	200	50%	50%	4380	YES
	20	Bedroom	11.18	7.52	277	7.52	100%	100	50%	50%	4380	YES
	21	LKD	34.30	27.10	114	5.84	22%	200	50%	50%	4380	NO
	22	LKD	36.82	29.33	300	21.73	74%	200	50%	50%	4380	YES
	23	Bedroom	13.10	8.77	336	8.77	100%	100	50%	50%	4380	YES
	24	Bedroom	13.38	8.94	379	8.94	100%	100	50%	50%	4380	YES
	25	LKD	33.53	25.47	491	22.33	88%	200	50%	50%	4380	YES
Level 2 Houses	80	Bedroom	11.41	7.69	333	7.69	100%	100	50%	50%	4380	YES
	81	Bedroom	11.62	7.86	376	7.86	100%	100	50%	50%	4380	YES
level 2 Middle terrace houses	74	Bedroom	15.41	10.76	321	10.76	100%	100	50%	50%	4380	YES
	75	Bedroom	16.42	11.55	406	11.55	100%	100	50%	50%	4380	YES
Level 2 Apartments	49	Bedroom	11.13	7.49	87	3.16	42%	100	50%	50%	4380	NO
	50	LKD	25.72	19.27	446	18.91	98%	200	50%	50%	4380	YES
	51	Bedroom	11.18	7.52	311	7.52	100%	100	50%	50%	4380	YES
	52	LKD	34.30	27.10	133	7.48	28%	200	50%	50%	4380	NO
	53	LKD	36.82	29.33	314	23.48	80%	200	50%	50%	4380	YES
	54	Bedroom	13.10	8.77	347	8.77	100%	100	50%	50%	4380	YES
	55	Bedroom	13.38	8.94	394	8.94	100%	100	50%	50%	4380	YES
	56	LKD	33.53	25.47	584	23.99	94%	200	50%	50%	4380	YES
Level 3 Apartments	57	Bedroom	11.13	7.49	99	3.66	49%	100	50%	50%	4380	NO
	58	LKD	25.72	19.27	468	19.18	100%	200	50%	50%	4380	YES
	59	Bedroom	11.18	7.52	328	7.52	100%	100	50%	50%	4380	YES
	60	LKD	34.30	27.10	146	8.21	30%	200	50%	50%	4380	NO
	61	LKD	36.82	29.33	331	24.53	84%	200	50%	50%	4380	YES
	62	Bedroom	13.10	8.77	351	8.77	100%	100	50%	50%	4380	YES
	63	Bedroom	13.38	8.94	406	8.94	100%	100	50%	50%	4380	YES
64	LKD	33.53	25.47	605	24.68	97%	200	50%	50%	4380	YES	

Appendix B2 -Detailed results of the daylight analysis - Proposed Development
(No Sky Line)

Property	Number of Rooms Tested	Rooms that meet BRE Guidelines	
		No.	%
Dwyer road	47	43	91%
Total	47	43	91%

Project Name: RBC-DRR_HTA-S_Dwyer Road_Proposed Assessment_230323_versionnew
 Project No.: 1234
 Report Title: Daylight Distribution Analysis - Proposed Scheme
 Date of Analysis: 27/03/2023

Floor Ref.	Room Ref	Room Use		Room Area	Lit Area Proposed	Meets BRE Criteria
Dwyer Road						
Level 0 Houses	76	Kitchen	Area m2	17.49	13.75	
			% of room		79.00%	NO
	77	Living Room	Area m2	23.35	23.11	
			% of room		99.00%	YES
Level 0 Middle Terrace	65	Living Room	Area m2	16.33	16.10	
			% of room		99.00%	YES
	66	Kitchen	Area m2	17.08	17.07	
			% of room		100.00%	YES
	67	Kitchen	Area m2	16.36	8.38	
			% of room		51.00%	NO
	68	Living Room	Area m2	15.41	15.14	
			% of room		98.00%	YES
Level 0 Apartments	83	Bedroom	Area m2	13.98	13.04	
			% of room		93.00%	YES
	84	LKD	Area m2	32.24	27.76	
			% of room		86.00%	YES
	85	LKD	Area m2	33.40	33.14	
			% of room		99.00%	YES
	86	Bedroom	Area m2	13.65	13.48	
			% of room		99.00%	YES
	87	Bedroom	Area m2	13.59	13.51	
			% of room		99.00%	YES
Level 1 Houses	78	Bedroom	Area m2	11.14	11.00	
			% of room		99.00%	YES
	79	Bedroom	Area m2	11.77	11.50	
			% of room		98.00%	YES
Level 1 Middle Terrace	69	Bedroom	Area m2	16.49	16.33	
			% of room		99.00%	YES
	70	Bedroom	Area m2	16.67	16.55	
			% of room		99.00%	YES
	71	Bedroom	Area m2	7.65	6.08	
			% of room		79.00%	NO
	72	Bedroom	Area m2	11.30	6.41	

Project Name: RBC-DRR_HTA-S_Dwyer Road_Proposed Assessment_230323_versionnew
 Project No.: 1234
 Report Title: Daylight Distribution Analysis - Proposed Scheme
 Date of Analysis: 27/03/2023

Floor Ref.	Room Ref	Room Use		Room Area	Lit Area Proposed	Meets BRE Criteria
	73	Bedroom	% of room Area m2 % of room	12.11	57.00% 11.79 97.00%	NO YES
Level 1 Apartments	18	Bedroom	Area m2	11.13	10.15	
			% of room		91.00%	YES
	19	LKD	Area m2	25.72	25.45	
			% of room		99.00%	YES
	20	Bedroom	Area m2	11.18	11.10	
			% of room		99.00%	YES
	21	LKD	Area m2	34.30	31.68	
			% of room		92.00%	YES
	22	LKD	Area m2	36.82	36.82	
			% of room		100.00%	YES
Level 2 Houses	23	Bedroom	Area m2	13.10	13.02	
			% of room		99.00%	YES
	24	Bedroom	Area m2	13.38	13.20	
			% of room		99.00%	YES
Level 2 Middle Terrace	25	LKD	Area m2	33.53	33.29	
			% of room		99.00%	YES
	80	Bedroom	Area m2	11.41	11.27	
Level 2 Middle Terrace			% of room		99.00%	YES
	81	Bedroom	Area m2	11.62	11.40	
			% of room		98.00%	YES
Level 2 Middle Terrace	74	Bedroom	Area m2	15.41	15.25	
			% of room		99.00%	YES
	75	Bedroom	Area m2	16.42	16.31	
Level 2 Apartments			% of room		99.00%	YES
	49	Bedroom	Area m2	11.13	10.22	
			% of room		92.00%	YES
	50	LKD	Area m2	25.72	25.45	
			% of room		99.00%	YES
	51	Bedroom	Area m2	11.18	11.10	
			% of room		99.00%	YES
	52	LKD	Area m2	34.30	34.17	
			% of room		100.00%	YES
	53	LKD	Area m2	36.82	36.82	
Level 2 Apartments			% of room		100.00%	YES
	54	Bedroom	Area m2	13.10	13.02	
			% of room		99.00%	YES
	55	Bedroom	Area m2	13.38	13.20	

Project Name: RBC-DRR_HTA-S_Dwyer Road_Proposed Assessment_230323_versionnew
 Project No.: 1234
 Report Title: Daylight Distribution Analysis - Proposed Scheme
 Date of Analysis: 27/03/2023

Floor Ref.	Room Ref	Room Use		Room Area	Lit Area Proposed	Meets BRE Criteria
	56	LKD	% of room Area m2 % of room	33.53	99.00% 33.29 99.00%	YES YES
Level 3 Apartments	57	Bedroom	Area m2	11.13	10.29	
			% of room		92.00%	YES
	58	LKD	Area m2	25.72	25.45	
			% of room		99.00%	YES
	59	Bedroom	Area m2	11.18	11.10	
			% of room		99.00%	YES
	60	LKD	Area m2	34.30	34.29	
			% of room		100.00%	YES
	61	LKD	Area m2	36.82	36.82	
			% of room		100.00%	YES
	62	Bedroom	Area m2	13.10	13.02	
			% of room		99.00%	YES
	63	Bedroom	Area m2	13.38	13.20	
			% of room		99.00%	YES
	64	LKD	Area m2	33.53	33.29	
			% of room		99.00%	YES

Appendix B3 -Detailed results of the sunlight analysis - Proposed Development (Sunlight Exposure)

Property	Number of Rooms Tested	Rating				No. of Rooms Satisfying Criteria
		High	Medium	Minimum	Failed	
Dwyer Road	13	13	0	0	0	13
Total	13	13	0	0	0	13

Project Name: RBC-DRR_HTA-S_Dwyer Road_Proposed Assessment_230323_versionnew
 Project No.: 1234
 Report Title: Sunlight Exposure Analysis - Proposed Scheme
 Date: 27/03/2023

Floor Ref	Room Ref	Room Attribute	Room Use	Window Ref	Window Orientation	Proposed Sunlight Exposure	Rating
House East							
Level 0 Houses	77		Living Room	256	189°	7.7	
				257	99°	3.4	
						9.2	High
Level 0 middle terrace houses	68		Living Room	237	180°	8.8	
						8.8	High
Level 0 Apartments	84		LKD	66	0°N	0	
				74	180°	6.4	
						6.4	High
	85		LKD	76	180°	4.8	
				77	180°	4.8	
				78	180°	7.1	
				83	90°N	2.8	
						8.3	High
Level 1 Apartments	19		LKD	46	180°	6.4	
				47	180°	6.4	
				56	270°N	2.3	
						7.9	High
	21		LKD	39	0°N	0	
				49	180°	6.4	
						6.4	High
	25		LKD	51	180°	4.8	
				53	180°	4.8	
				54	180°	7.1	
				59	90°N	2.8	
						8.3	High
Level 2 Apartments	50		LKD	195	180°	6.4	
				196	180°	6.4	
				204	270°N	2.3	
						7.9	High
	52		LKD	190	0°N	0	
				198	180°	6.4	
						6.4	High
	56		LKD	200	180°	4.8	
				201	180°	4.8	
				202	180°	7.1	
				207	90°N	2.8	
						8.3	High
Level 3	58		LKD	219	180°	6.4	
				220	180°	6.4	
				228	270°N	2.3	
						7.9	High
	60		LKD	214	0°N	0	
				222	180°	6.4	

Project Name: RBC-DRR_HTA-S_Dwyer Road_Proposed Assessment_230323_versionnew
Project No.: 1234
Report Title: Sunlight Exposure Analysis - Proposed Scheme
Date: 27/03/2023

Floor Ref	Room Ref	Room Attribute	Room Use	Window Ref	Window Orientation	Proposed Sunlight Exposure	Rating
Apartments						6.4	High
	64		LKD	224	180°	4.8	
				225	180°	4.8	
				226	180°	7.1	
				231	90°N	2.8	
						8.3	High

Appendix C -Sunlight Assessment: Impact on the surrounding buildings

ber of Windows Tested	Annual					Winter					Both		
	Windows that meet BRE Guidelines		No. of Windows Experiencing Adverse Impacts	Windows that experience gains beyond the consented baseline		Windows that meet BRE Guidelines		No. of Windows Experiencing Adverse Impacts	Windows that experience gains beyond the consented baseline		Windows that meet BRE Guidelines		No. of Windows Experiencing Adverse Impacts
	No.	%		No.	%	No.	%		No.	%	No.	%	
34	31	91%	3	0	0%	25	74%	9	0	0%	25	74%	9
34	31	91%	3	0	0%	25	74%	9	0	0%	25	74%	9

Project Name: RBC-DRR_HTA-S_Dwyer Road_impact assessment_230313_
 Project No.: 1234
 Report Title: Daylight & Sunlight Analysis - Neighbour
 Date of Analysis: 15/03/2023

Floor Ref.	Window Ref.	VSC	Pr/Ex	Meets BRE Criteria	Window Orientation	Annual	Pr/Ex	Meets BRE Criteria	Winter	Pr/Ex	Meets BRE Criteria
Charles court											
Level 0 Charles Court	1	Existing 38.00 Proposed 20.10	0.53	NO	181°	66.00 40.00	0.61	YES	25.00 7.00	0.28	YES
	2	Existing 38.15 Proposed 17.39	0.46	NO	181°	67.00 32.00	0.48	YES	26.00 5.00	0.19	YES
	4	Existing 37.40 Proposed 28.64	0.77	YES	91°	35.00 19.00	0.54	NO	7.00 2.00	0.29	NO
	5	Existing 37.22 Proposed 30.39	0.82	YES	91°	35.00 23.00	0.66	NO	7.00 2.00	0.29	NO
	6	Existing 34.98 Proposed 30.69	0.88	YES	91°	33.00 26.00	0.79	YES	9.00 3.00	0.33	NO
	7	Existing 27.76 Proposed 24.13	0.87	YES	91°	34.00 29.00	0.85	YES	7.00 4.00	0.57	NO
	8	Existing 36.42 Proposed 31.30	0.86	YES	91°	35.00 28.00	0.80	YES	7.00 3.00	0.43	NO
	9	Existing 21.91 Proposed 13.30	0.61	NO	180°	42.00 32.00	0.76	YES	13.00 4.00	0.31	NO
	10	Existing 37.42 Proposed 34.70 Proposed 34.21	0.93	YES	91°	44.00 35.00	0.80	YES	15.00 6.00	0.40	YES
	30	Existing 21.06 Proposed 19.30	0.92	YES	180°	39.00 38.00	0.97	YES	12.00 11.00	0.92	YES
Level 1_Charles court	3	Existing 38.92 Proposed 21.05	0.54	NO	181°	67.00 42.00	0.63	YES	26.00 5.00	0.19	YES
	66	Existing 38.22 Proposed 30.42	0.80	YES	91°	35.00 22.00	0.63	NO	7.00 2.00	0.29	NO
	67	Existing 38.04 Proposed 32.11	0.84	YES	91°	35.00 26.00	0.74	YES	7.00 2.00	0.29	NO
	68	Existing 35.77 Proposed 32.21	0.90	YES	91°	33.00 27.00	0.82	YES	9.00 3.00	0.33	NO
	69	Existing 28.36 Proposed 25.37 Proposed 28.16	0.89	YES	91°	34.00 31.00	0.91	YES	7.00 4.00	0.57	YES
	74	Existing 22.80 Proposed 21.17	0.93	YES	180°	43.00 42.00	0.98	YES	16.00 15.00	0.94	YES
	76	Existing 22.98 Proposed 15.61	0.68	NO	180°	45.00 37.00	0.82	YES	16.00 8.00	0.50	YES
	77	Existing 38.26 Proposed 36.04	0.94	YES	91°	44.00 37.00	0.84	YES	15.00 8.00	0.53	YES
	34	Existing 39.40 Proposed 31.91	0.81	YES	181°	67.00 60.00	0.90	YES	26.00 19.00	0.73	YES
Level 2_Charles Court	35	Existing 39.41 Proposed 29.85	0.76	YES	181°	67.00 57.00	0.85	YES	26.00 16.00	0.62	YES
	37	Existing 39.44 Proposed 31.28	0.79	YES	181°	55.00 46.00	0.84	YES	26.00 17.00	0.65	YES
	50	Existing 36.57 Proposed 33.94	0.93	YES	91°	33.00 30.00	0.91	YES	9.00 6.00	0.67	YES
	51	Existing 28.93 Proposed 26.70	0.92	YES	91°	34.00 32.00	0.94	YES	7.00 5.00	0.71	YES
	52	Existing 23.97 Proposed 18.23	0.76	NO	180°	45.00 40.00	0.89	YES	16.00 11.00	0.69	YES
	53	Existing 39.05 Proposed 37.41	0.96	YES	91°	44.00 40.00	0.91	YES	15.00 11.00	0.73	YES
	56	Existing 24.21 Proposed 22.82	0.94	YES	180°	44.00 44.00	1.00	YES	17.00 17.00	1.00	YES

Project Name: RBC-DRR_HTA-S_Dwyer Road_impact assessment_230313_
 Project No.: 1234
 Report Title: Daylight & Sunlight Analysis - Neighbour
 Date of Analysis: 15/03/2023

Floor Ref.	Window Ref.	VSC	Pr/Ex	Meets BRE Criteria	Window Orientation	Annual	Pr/Ex	Meets BRE Criteria	Winter	Pr/Ex	Meets BRE Criteria
Level 3_Charles court	41	Existing 39.48	0.89	YES	181°	67.00	0.99	YES	26.00	0.96	YES
		Proposed 35.28				66.00			25.00		
	42	Existing 39.52	0.86	YES	181°	67.00	0.97	YES	26.00	0.92	YES
		Proposed 34.05				65.00			24.00		
	43	Existing 39.49	0.89	YES	181°	55.00	0.98	YES	26.00	0.96	YES
		Proposed 35.04				54.00			25.00		
	58	Existing 37.58	0.96	YES	91°	33.00	1.00	YES	9.00	1.00	YES
		Proposed 36.04				33.00			9.00		
	59	Existing 29.49	0.95	YES	91°	34.00	1.00	YES	7.00	1.00	YES
		Proposed 28.15				34.00			7.00		
	60	Existing 25.52	0.87	YES	180°	47.00	0.98	YES	16.00	0.94	YES
		Proposed 22.09				46.00			15.00		
	61	Existing 39.47	0.98	YES	91°	44.00	0.98	YES	15.00	0.93	YES
		Proposed 38.49				43.00			14.00		
	64	Existing 25.85	0.97	YES	180°	48.00	1.00	YES	17.00	1.00	YES
		Proposed 25.16				48.00			17.00		

Appendix D - Shadow plots

In accordance with the BRE guide we have undertaken overshadowing assessments to the amenity spaces. The results of the overshadowing analysis are shown in the

following pages. The model was tested on 21 March (the Spring Equinox) and 21 June (mid-summer's day).

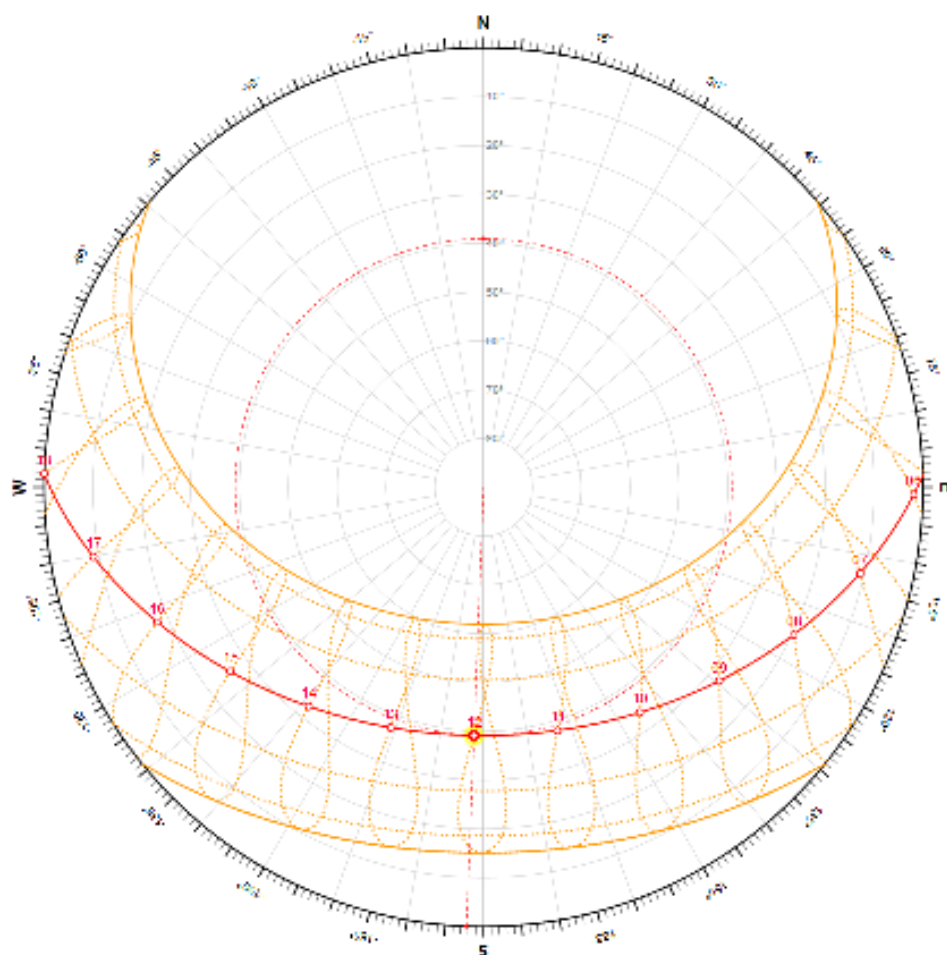
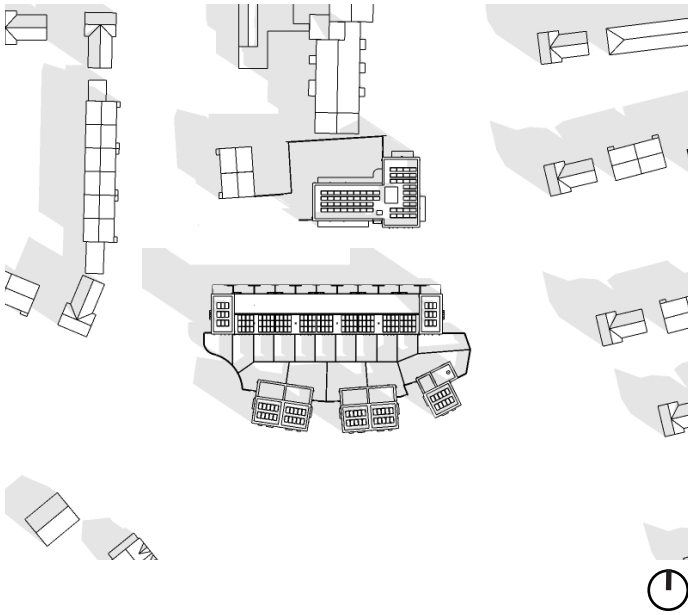
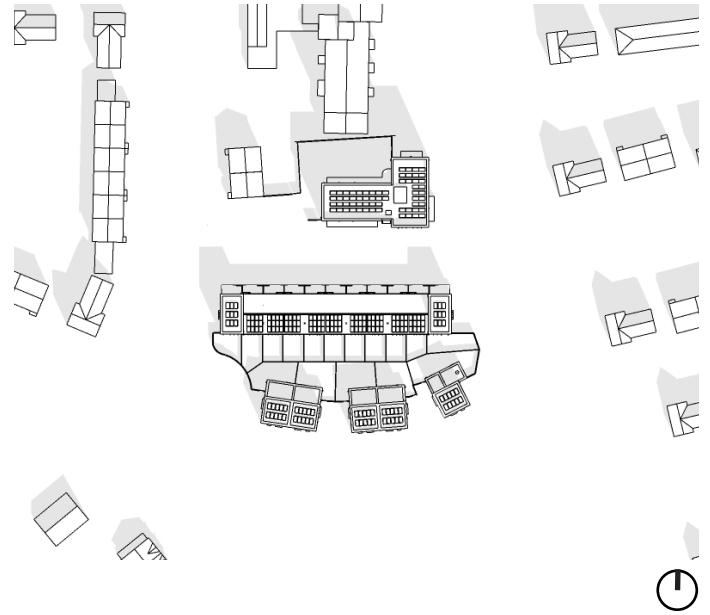


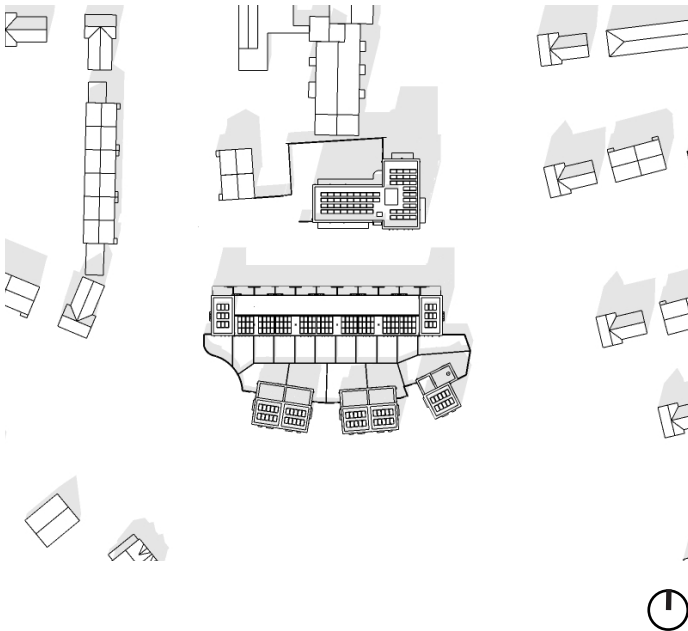
Figure B.1 - Sun path diagram for London, UK



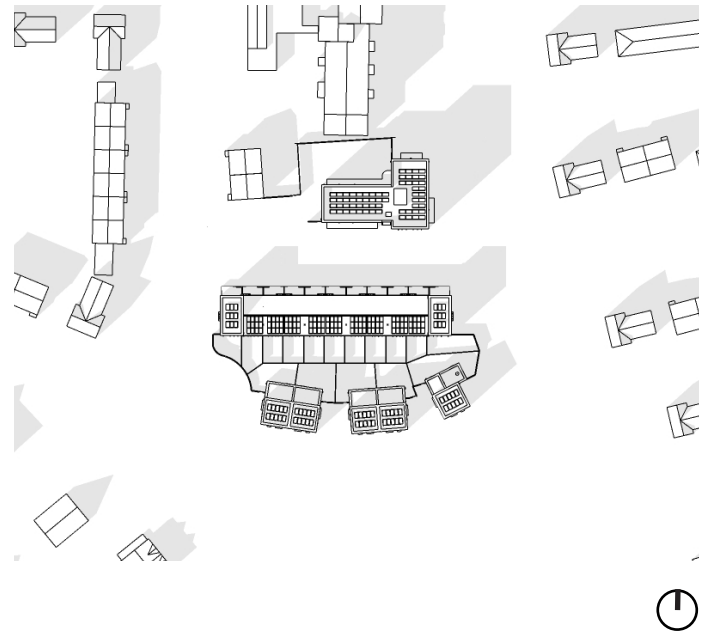
21 March - 9:00



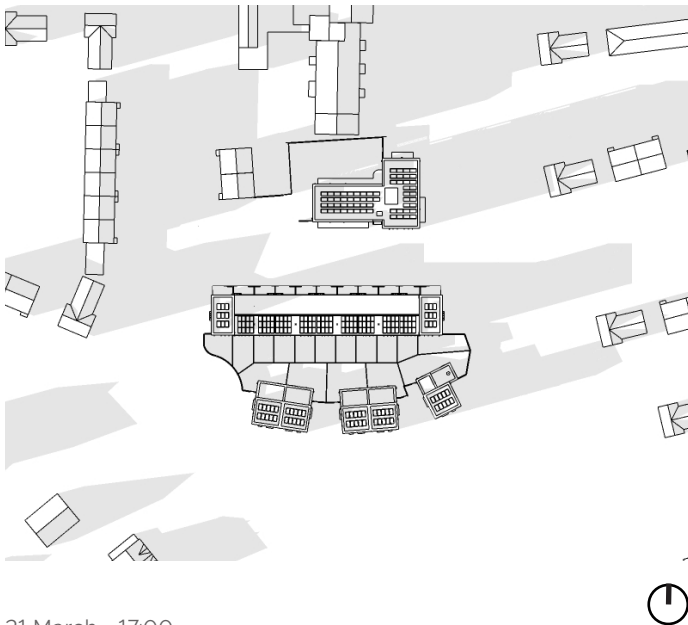
21 March - 11:00



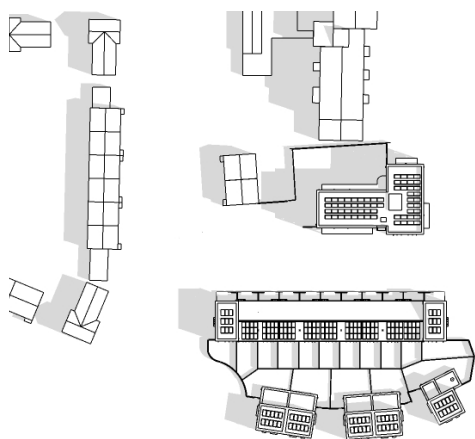
21 March - 13:00



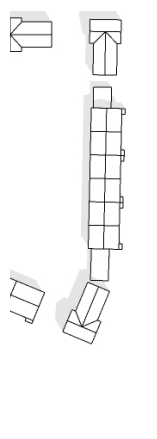
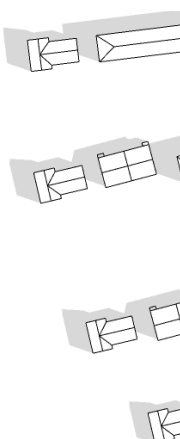
21 March - 15:00



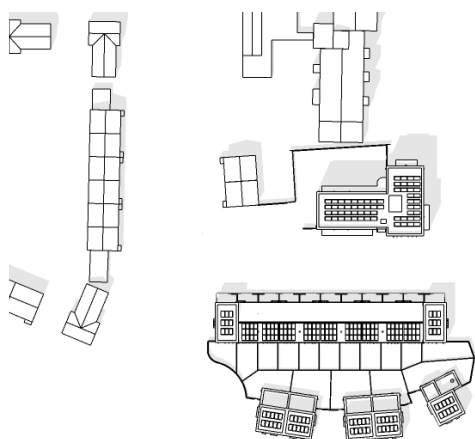
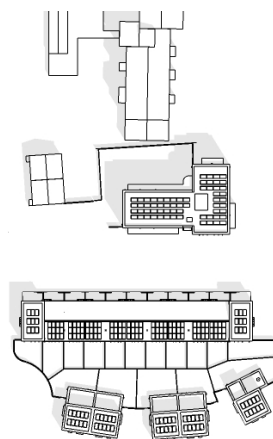
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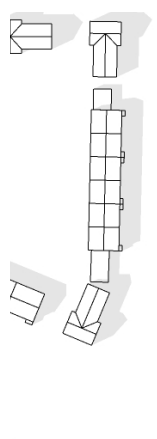
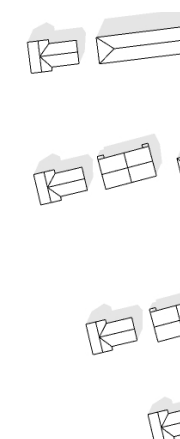
21 June - 9:00



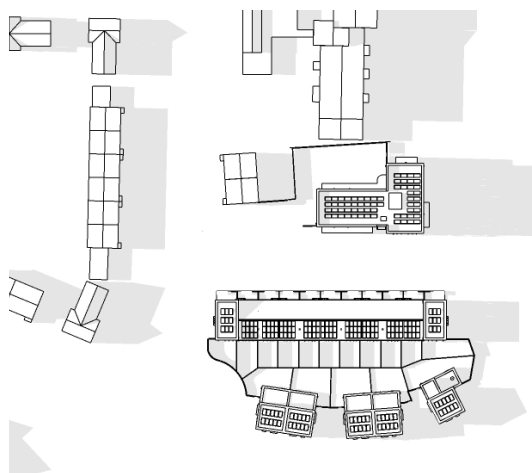
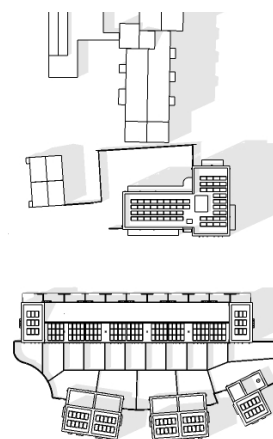
21 June - 11:00



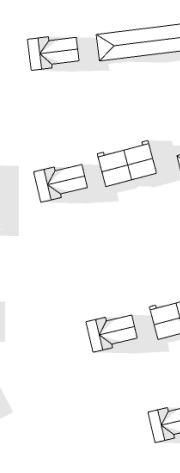
21 June - 13:00



21 June - 15:00



21 June - 17:00



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