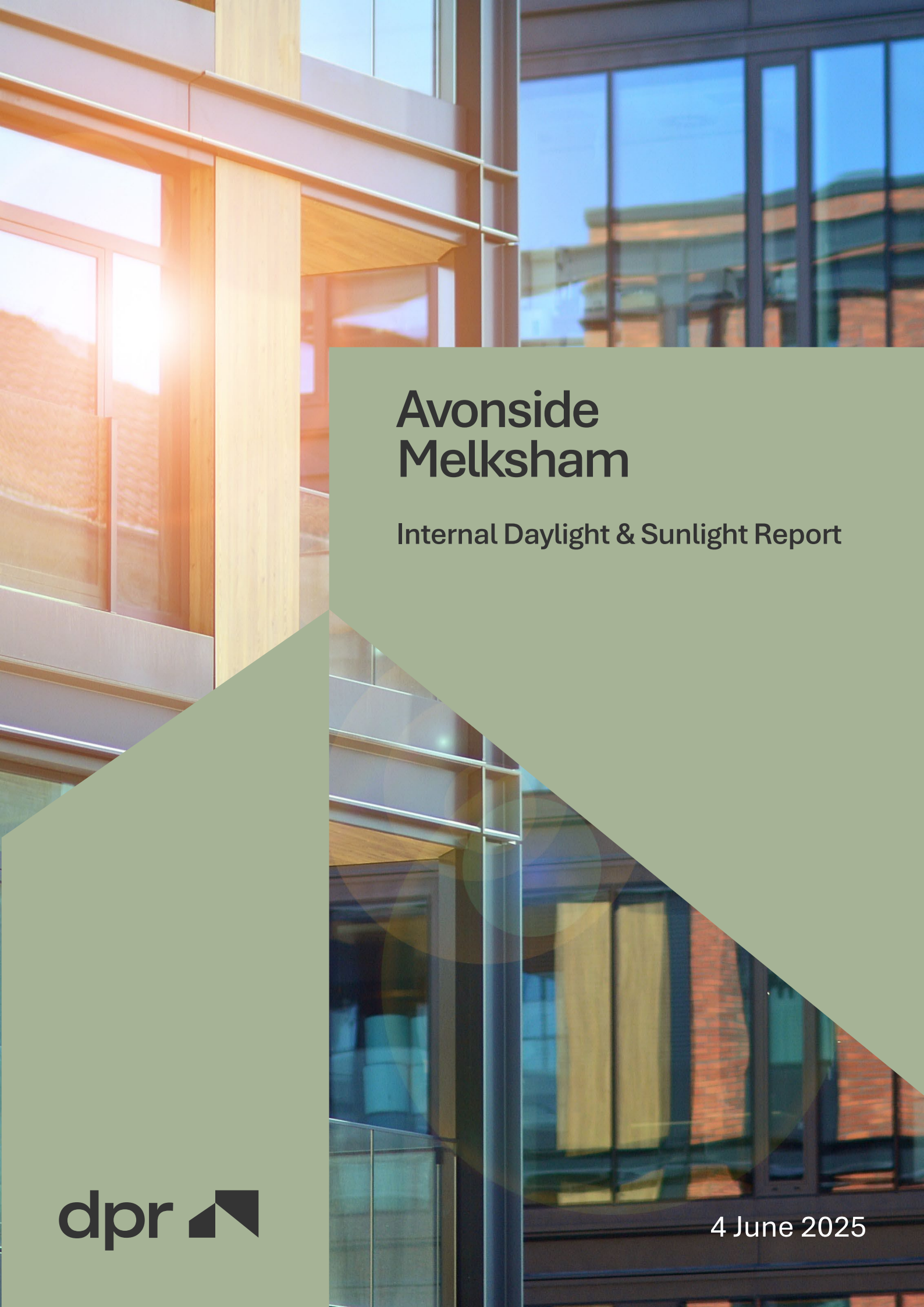




Avonside Melksham

Internal Daylight & Sunlight Report

PROJECT INFORMATION

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ABOUT US

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Statements and opinions in this report are expressed on behalf of DPR LLP.

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1.0 Introduction

- 1.1. DPR LLP have been engaged by the Applicant to assess the daylight and sunlight provision to the new dwellings within the Proposed Development at Avonside, Melksham (“the Site”). This report has been prepared to accompany the Applicant’s planning application.
- 1.2. The Site is located within Wiltshire Council.
- 1.3. The scheme will comprise the refurbishment and re-configuration of the existing building to contain a mixture of commercial, food/beverage, and leisure facilities at ground floor level, with commercial and residential dwellings on the upper floors (“the Proposed Development”).
- 1.4. Our 3D computer model of the Proposed Development and its surroundings is illustrated in [Figure 1](#) below and on our 3D view drawing at Appendix 2.



Figure 1 – 3D computer model of the Proposed Development and surrounding context

- 1.5. Our daylight and sunlight study has been carried out using the assessment methodologies recommended in ‘*Site Layout Planning for Daylight and Sunlight: A guide to good practice*’ (BR209, 2022 edition) published by the Building Research Establishment.
- 1.6. The 2022 edition of the BRE guide introduced new methodologies and numerical guidelines for assessing internal daylight and sunlight within buildings. The numerical guidelines for daylight provision recommended in the 2022 edition of the BRE guide are more difficult to achieve than those in the 2011 edition. Consequently, the Proposed Development will achieve a lower percentage adherence to the 2022 guidelines than to the 2011 guidelines.
- 1.7. This report is accompanied by the Appendices listed on the Contents page, including an explanation of the BRE assessment methodologies, a glossary of technical terms, drawings, and tabulated results.

2.0 Planning policy and guidance

National Planning Policy and Guidance

National Planning Policy Framework (December 2024)

- 2.1. The National Planning Policy Framework (NPPF) sets out the Government's planning policies and how these should be applied. It provides a framework within which locally prepared plans for housing and other development can be produced. It places an emphasis on sustainable development and delivery of housing.
- 2.2. Chapter 11 of the NPPF, entitled "Making effective use of land", promotes the effective use of land in meeting the need for homes and other uses. It gives examples such as developing under-utilised land and buildings, especially if this would help to meet identified needs for housing where land supply is constrained and available sites could be used more effectively, and upward extensions to create new homes, where they would be consistent with the prevailing height and form of neighbouring properties and the overall street scene.
- 2.3. In particular, paragraph 130 of the NPPF states:

Area-based character assessments, design guides and codes and masterplans can be used to help ensure that land is used efficiently while also creating beautiful and sustainable places. Where there is an existing or anticipated shortage of land for meeting identified housing needs, it is especially important that planning policies and decisions avoid homes being built at low densities, and ensure that developments make optimal use of the potential of each site. In these circumstances:

c) local planning authorities should refuse applications which they consider fail to make efficient use of land, taking into account the policies in this Framework. In this context, when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site (as long as the resulting scheme would provide acceptable living standards).

National Design Guide (January 2021)

- 2.4. The National Design Guide is part of a suite of planning practice guidance that supports the NPPF. The National Design Guide outlines the Government's priorities for well-designed places.
- 2.5. Paragraph 71 of the guidance dealing with built form states:

Proposals for tall buildings (and other buildings with a significantly larger scale or bulk than their surroundings) require special consideration. This includes their location and siting; relationship to context; impact on local character, views and sight lines; composition - how they meet the ground and the sky; and environmental impacts, such as sunlight, daylight, overshadowing and wind. These need to be resolved satisfactorily in relation to the context and local character.

- 2.6. Paragraphs 126 and 130 of the guidance dealing with homes and buildings state:

Well-designed homes and communal areas within buildings provide a good standard and quality of internal space. This includes room sizes, floor-to-ceiling heights, internal and external storage, sunlight, daylight and ventilation. The quality of internal space needs careful consideration in higher density developments, particularly for family accommodation, where access, privacy, daylight and external amenity space are also important.

Well-designed private or shared external spaces are fit for purpose and incorporate planting wherever possible. The appropriate size, shape and position for an external amenity space can be defined by considering:

- *how the associated building sits in the wider context, including access to public and open spaces;*
- *how the amenity space will be used, what for, and by whom;*
- *environmental factors that may affect its usability, such as sunlight and shade, noise or pollution;*
- *wider environmental factors affecting its quality or sustainability, such as a green corridor or drainage.*

National Model Design Code (June 2021)

2.7. The National Model Design Code provides detailed guidance to planning authorities on the production of design codes, guides and policies to promote successful design.

2.8. Paragraphs 114 to 117 of section B.2. dealing with built form states:

Building height may also have an impact on local environmental conditions in neighbouring properties, amenity spaces and public spaces in terms of daylight, sunlight, overshadowing, wind and micro-climate. The placing of tall buildings needs to maximise user comfort of spaces between buildings by taking into account their impact on orientation and overshadowing of public and private spaces, quality of external spaces at ground level, wind tunnel effect, noise pollution and enable safe dispersion of pollutants.

Tall buildings can be considered in design codes. It may be appropriate to include criteria for the locations of tall buildings in some area types.... Tools that can assist with this include ... characterisation studies and design strategies, dealing with issues such as urban form, historic character, building typologies, prevailing sunlight and daylight levels, green infrastructure, amenity space and quality of external spaces at ground level.

2.9. Paragraph 188 of section H.2 dealing with health and wellbeing states:

The built environment has a significant impact on people's health and wellbeing. This relates across the design code with regard to walkable neighbourhoods, access to greenery and recreation, attractive buildings and public spaces, space standards, and strong communities. There are also specific elements relating to the impact of the design of homes and buildings that affect wellbeing including daylight, aspect and privacy, noise mitigation, security and access to private outdoor space.

Good quality housing creates a pleasant indoor environment with adequate levels of natural lighting, and sunlight, without problems of overheating, good quality ventilation, privacy from overlooking and minimal noise impact.

2.10. Paragraph 202 of section R.1 dealing with energy states:

The design of windows needs to consider orientation to balance heat loss and beneficial solar gain, daylight and sunlight. Southern-facing glazing can be beneficial in contributing to overall energy demand in winter. It can lead to overheating in summer and excessive heat loss on cold cloudy days in winter. Glazing needs to be sized appropriately for context and passive measures such as external shading devices or provision for future installation of shading devices needs to be considered to reduce reliance on mechanical ventilation.

BRE Report 209, 'Site Layout Planning for Daylight and Sunlight: A guide to good practice' (2022)

2.11. The leading publication providing national guidance on the provision of daylight and sunlight to new development, is 'Site Layout Planning for Daylight and Sunlight: A guide to good practice' (BR209, third edition, 2022) published by the Building Research Establishment (hereafter referred to as "the BRE guide"). It is referred to in development plan documents or supplementary planning documents of most planning authorities. It is intended to be used in conjunction with the interior daylighting recommendations in BS EN17037:2018 'Daylight in buildings' and in CIBSE's lighting guide, LG 10 'Daylighting - a guide to designer'.

2.12. The BRE guide states:

Summary

This guide gives advice on site layout planning to achieve good daylighting and sun lighting, within buildings and in the open spaces between them. It is intended to be used in conjunction with the interior daylight recommendations for new buildings in the British Standard, 'Daylight in buildings', BS EN 17037. It contains guidance on site layout to provide good natural lighting within a new development ... It is purely advisory and the numerical target values within it may be varied to meet the needs of the development and its location.

Introduction

(Its) main aim is ... to help to ensure good conditions in the local environment, considered broadly, with enough sunlight and daylight on or between the buildings for good interior and exterior conditions.

The guide is intended for building designers and their clients, consultants and planning officials. The advice given 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... The calculation methods ... are entirely flexible in this respect...

British Standard, BS EN 17037:2018, 'Daylight in buildings' (May 2019)

- 2.13. British Standard, BS EN 17037:2018, 'Daylight in buildings' provides a standard and methodology by which to assess daylight and sunlight provision in new buildings. Its general recommendations for daylight provision in a space may not be achievable for some buildings in the UK, particularly dwellings; for example, those with basement rooms or significant external obstructions, such as those in dense urban areas or in existing buildings being refurbished or converted into dwellings. The standard's National Annex therefore provides guidance on minimum daylight provision in UK dwellings.

Local planning policy**Wiltshire Council Core Strategy (January 2015)**

- 2.14. The Wiltshire Core Strategy provides an up-to-date strategic planning policy for Wiltshire covering a period up to 2026.
- 2.15. Core Policy 27 states that a high standard of design is required to all new developments, including extensions, alterations and changes to use existing buildings. With Paragraph vii stating that new development should:

Having regard to the compatibility of adjoining buildings and uses, ensuring appropriate levels of amenity are achievable

3.0 Assessment methodology and numerical guidelines

- 3.1. The technical assessments that underpin this daylight and sunlight study have been carried out in accordance with the assessment methodologies recommended in the BRE guide.
- 3.2. The BRE guidance and numerical guidelines are summarised below. The technical assessment methodologies are explained at Appendix 1 of this report, which also contains a glossary of technical terms.

Daylight to new dwellings

Detailed design

- 3.3. Detailed recommendations for daylight in new buildings are given in BS EN 17037, 'Daylight in Buildings' ('the British Standard') and repeated in the BRE guide. Appendix C of the BRE guide gives guidance on how to calculate the amount of daylight inside a room, which is summarised at Appendix 1 of this report.
- 3.4. Daylight provision in new rooms may be checked using either of the methods described in the BRE guide: either direct prediction of daylight illuminance levels using hourly climate data, or the use of the daylight factor, which is a ratio of unobstructed external illuminance under overcast sky conditions. Both are measures of the overall amount of daylight in a space. We have calculated daylight provision using the illuminance method.
- 3.5. The amount of daylight inside a room will depend on:
 - the view of sky and level of obstruction outside the window(s);
 - the surface reflectances of the external environment;
 - the size, position and diffuse light transmittance of the window glazing; and
 - the surface reflectances of the room surfaces.
- 3.6. Appendix C of the BRE guide gives recommendations for typical and maximum reflectances of exterior and interior surfaces and glazing transmittance, which are repeated at Appendix 1 of this report.

Numerical guidelines

- 3.7. The following minimum recommendations are given for housing in the UK:
 - 100 lux in bedrooms
 - 150 lux in living rooms
 - 200 lux in kitchens
- 3.8. 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 annual daylight hours.
- 3.9. They are minimum recommended values for locations where a predominantly daylit appearance is not achievable; for example, in basements or with significant external obstructions, such as in a dense urban area or with tall trees outside, or for existing buildings being refurbished or converted into dwellings.
- 3.10. Non-daylit internal kitchens should be avoided wherever possible, especially if the kitchen is used as a dining area too. If the layout means that a small internal kitchen is inevitable, it should be directly linked to a well daylit room.
- 3.11. Where a room has a shared use, the highest target should apply. For example, in a bed-sitting room in student accommodation, the value for a living room should be used if students would often spend time in their rooms during the day. However, the BRE guide advises that local authorities could use discretion here. For example, the target for a living room could be used for a combined living/kitchen/dining area (LKD) of kitchen-diner (KD) if the kitchens are not treated as habitable spaces, as it may avoid small

separate kitchens in a design. (The kitchen space would still need to be included in the assessment area.) For this reason, we have adopted an alternative target of 150 lux for LKDs and KDs in our assessment.

Sunlight to new dwellings

- 3.12. In housing, the main requirement for sunlight is in living rooms, where it is valued at any time of day but especially in the afternoon. Sunlight is also required in conservatories. It is viewed as less important in bedrooms and in kitchens.
- 3.13. Site layout is the most important factor affecting the duration of sunlight in buildings. It can be divided into two main issues, orientation and overshadowing.
- 3.14. A south-facing window will, in general, receive most sunlight, while east- and west-facing windows will receive sunlight only at certain times of the day, and a north-facing elevation will only receive it on a handful of occasions (early morning and late evening in summer).
- 3.15. Sensitive layout design of flats will attempt to ensure that each individual dwelling has at least one main living room which can receive a reasonable amount of sunlight. The overall sunlighting potential of a large residential development may be initially assessed by counting how many dwellings have a window to a main living room facing south, east, or west. The aim should be to minimise the number of dwellings whose living rooms face solely north, northeast, or northwest, unless there is some compensating factor such as an appealing view to the north.
- 3.16. The overall access to sunlight of a new development can be considerably enhanced if the layout of new buildings is designed with care so that they overshadow each other as little as possible.

Numerical guideline

- 3.17. For interiors, access to sunlight can be quantified. BS EN 17037 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. The BRE guide suggests that 21 March (equinox) is used. The medium and high levels of recommendation are three hours and four hours respectively.
- 3.18. The criterion apply to rooms of all orientations, although the BRE guide advises that if a room faces significantly north of due east or west it is unlikely to be met. At least one habitable room per dwelling – preferably a main living room – should meet at least the minimum criterion.

Summary

- 3.19. In general, a dwelling will appear reasonably sunlit provided:
 - at least one main window wall faces 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.
- 3.20. Where groups of dwellings are planned, site layout design should aim to maximise the number of dwellings with a main living room that meets the above recommendations.

Flexible application of the guidelines and alternative target values

- 3.21. The default numerical guidelines in the BRE guide are not mandatory and must be interpreted flexibly because natural lighting is only one of many factors in site layout design (see paragraph 2.12 above).
- 3.22. For housing applications, the NPPF requires local planning authorities to take a flexible approach in applying daylight and sunlight policies and guidance where they would otherwise inhibit making efficient use of a site, as long as the resulting scheme would provide acceptable living standards (see paragraph 2.3 above).

- 3.23. For the reasons explained at paragraph 3.16 above, we have adopted an alternative target of 150 lux for the minimum illuminance level for any space multi-purpose space containing a kitchen, such as LKDs, KDs and studios.
- 3.24. Ultimately, it is for the planning authority to judge whether the levels of daylight and sunlight provision within the Proposed Development are acceptable in their neighbourhood context, having regard to all relevant planning policies and guidance and balanced against the merits of the Proposed Development.

4.0 Information used in our technical study

- 4.1. We have undertaken our technical study using a 3D computer model built in AutoCAD or Revit and specialist analysis software, which runs the assessments recommended in the BRE guide.
- 4.2. The 3D computer model includes rooms, window apertures, any external projections such as balconies, and nearby obstructions.
- 4.3. We compiled our 3D computer model from the following information:
 - 4.3.1. Proposed Development: 3D model and 2D floor plans supplied by Buckley Gray Yeoman Architects in May 2025 (file names: 1207-ga-00-a-g, 1608 Model, GA-00, 01, 02, 03, RF, GE-05-09 and GS-01-09)
 - 4.3.2. Existing and surrounding context: 2D topographical survey by South West Surveys
- 4.4. Our 3D computer model is illustrated in Figure 1 of Section 1.0, Introduction and on our spot-height drawing at Appendix 2.
- 4.5. For the daylight illuminance assessment, we used the window and room parameters stated in Table 1.

Table 1 – Window and room parameters used in illuminance calculations

Parameter	Value
Maintenance factor (dirt on glass)	0.92 for vertical windows with normal exposure in residential developments in urban locations with good maintenance
Diffuse light transmittance of glazing	0.68 for double glazing
Frame and glazing bar factor	0.7 for metal frames and large panes
Surface reflectances	Reflectances from the guidelines: 0.8 for white ceilings (0.6 for balcony soffits) 0.7 for pale cream/light pastel walls 0.4 for light wood floors 0.2 for exterior surfaces

Limitations and assumptions

- 4.6. In compiling our 3D computer model for our technical study, we have sought to be as accurate as reasonably possible within the scope of our instruction. We have relied upon the information noted above. The surface reflectance of internal wall finishes has typically been applied to the soffits, reveals and cills of window apertures, except glazed door openings, where the reflectance of the floor finish has been applied to the cills.
- 4.7. We have used proven and trusted specialist computer software (Waldram Tools for AutoCAD® or Revit®) to run the calculations recommended in the BRE guide.
- 4.8. To the best of our knowledge, the information and advice contained in this report is accurate at the date of issue, based on the information provided to or procured by us prior to its production.

5.0 Scope of the assessment

- 5.1. Within the Proposed Development, we have assessed daylight and sunlight to all habitable rooms within the scheme.
- 5.2. Daylight has been assessed to all 46 habitable rooms across 21 proposed dwellings.
- 5.3. Sunlight has been assessed to all habitable rooms irrespective of orientation; however, it should be borne in mind that rooms that do not have at least one window facing within 90° of due south will be much less likely to meet the sunlight guidelines (see paragraph 3.23 above).

6.0 Internal daylight and sunlight results

- 6.1. We assessed all habitable rooms to dwellings within the Proposed Development, comprising 46 rooms across 21 dwellings.
- 6.2. The room uses and reference numbers of the rooms that are included in our assessment are shown on the room location plans at Appendix 3. The plans also show the percentage of the assessment area of each room ('SDA % of Area') that would achieve the daylight illuminance target for the room type.
- 6.3. The daylight and sunlight assessment results are tabulated at Appendix 3. Coloured font has been used in the table to identify results that would be below the numerical guidelines, as follows:
- Orange font = proposed value is within 20% of the guideline
 - Red font = proposed value is not within 20% of the guideline.
- 6.4. To recap, the numerical guidelines are:
- 6.4.1. Daylight: 100 lux in bedrooms, 150 lux in living rooms, or 200 lux in kitchens or multi-purpose rooms containing a kitchen, e.g., LKDs. (Note: 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 annual daylight hours.)
- 6.4.2. Sunlight: At least 1.5 hours of sunlight on 21 March to at least one habitable room per dwelling, preferably a main living room.

Daylight to new dwellings

- 6.5. The level of adherence to the BRE daylight guidelines is summarised in Table 2 below.

Table 2 – Daylight illuminance summary table

Building	No. of rooms tested	Daylight illuminance		
		Meeting guideline		Below guideline
		No.	%	
Avonside Enterprise Park	46	46	100%	0
Totals:	46	46	100%	0

- 6.6. All 46 (100%) habitable rooms tested comfortably satisfy the BRE guidelines.
- 6.7. Overall, the daylight results indicate that the proposed dwellings will all benefit from excellent levels of natural light.

Sunlight to new dwellings

6.8. All rooms in our assessment have been assessed for sunlight regardless of orientation or room use.

6.9. The level of adherence to the BRE sunlight guidelines is summarised in Table 3 below.

Table 3 – Sunlight exposure summary table – rooms

Building	No. of rooms tested	Sunlight exposure (all rooms)		
		Meeting guideline		Below guideline
		No.	%	
Avonside Enterprise Park	46	31	67%	15
Totals:	46	31		15
		67%		33%

6.10. Of the 46 rooms assessed, 31 (67%) would satisfy the sunlight guideline (1.5 hours on 21 March).

6.11. The BRE states that all rooms regardless of orientation should be considered for the internal sunlight test. It is inevitable in any residential scheme that a proportion of rooms will face predominately north and therefore have less exposure to direct sunlight. The proposed scheme demonstrates an acceptable level of adherence to the BRE recommendations, which is commensurate with residential conversions in industrial buildings.

7.0 Summary and conclusion

- 7.1. We assessed the daylight and sunlight provision to all habitable rooms within the Proposed Development using the methodologies recommended in the BRE guide (2022 edition).
- 7.2. The assessed dwellings comprise a mixture of 1-bed and 2-bed units. The rooms assessed comprise a mixture of living/kitchen/dining rooms (LKDs) (including kitchen-diners), and bedrooms.
- 7.3. In total, 46 habitable rooms have been assessed across 21 dwellings.
- 7.4. All 46 (100%) habitable rooms will satisfy the BRE guidelines, indicating that all dwellings will benefit from good levels of daylight.
- 7.5. Turning to sunlight, of the 46 dwellings assessed, 31 (67%) would satisfy the guidelines, with at least one habitable room capable of receiving at least 1.5 hours of sunlight on 21 March.
- 7.6. The advice in the BRE guide is not mandatory, and its numerical guidelines should be interpreted flexibly. As noted in the NPPF a greater flexibility should be afforded when applying the guidelines to the Site because it is provided residential units in a town centre location.
- 7.7. Overall, the daylight and sunlight results demonstrate that the proposed scheme will generally provide excellent levels of natural light to the future occupiers.
- 7.8. It is submitted that the layout of the Proposed Development is consistent with the Council's local planning policy on daylight and sunlight, particularly having regard to paragraph 129 of the National Planning Policy Framework.

DPR LLP

Chartered Surveyors

Appendix 1

Assessment methodology and glossary

1. This appendix explains the daylight and sunlight assessment methodology recommended in '*Site Layout Planning for Daylight and Sunlight: A guide to good practice*' (BR209, 2022 edition) ('the BRE guide') and provides a glossary of the terminology used.

Daylight to new dwellings

2. BS EN 17037 '*Daylight in Buildings*' ('the British Standard') and the BRE guide provide two alternative methods for calculating the overall amount of daylight in a space:
 - illuminance method, or
 - daylight factor method.

Illuminance method

3. *Illuminance* is a measure of the amount of light falling on a surface, usually measured in lux (lumens per square metre). The illuminance method calculates the illuminance from daylight at each point on an assessment grid on the reference plane at hourly intervals for a typical year. It uses hourly climatic data for a typical year collected by a weather station near to the site's location and a mathematical model for the spatial distribution of real-world sky luminance (e.g., the Perez All-Weather Sky Model). Appropriate weather data files are available from various sources, including EnergyPlus and CIBSE.
4. The illuminance recommendations in the British Standard and BRE guide are based around the illuminances that would be met or exceeded over half of the room, over half of the annual daylight hours.

Daylight factor method

5. *Daylight factor* is the ratio of daylight illuminance at a reference point on the working plane within a space to outdoor illuminance on a horizontal plane due to an unobstructed CIE standard overcast sky. The daylight factor method calculates the daylight factor at each point on an assessment grid on the reference plane. The standard overcast sky model is independent of orientation and location. In order to account for different climatic conditions at different locations, the British Standard and BRE guide give equivalent different daylight factor targets for various locations in the UK.
6. The daylight factor recommendations in the British Standard and BRE guide are based on calculating the daylight factor that would be exceeded over half of the room. The recommended daylight factor values are location specific; a set of targets is provided for each of 10 locations in the UK. The target values for the reference location at the nearest latitude to the development location should be used.

Calculation model

7. Both methodologies usually require assessment via detailed computer modelling to simulate the illuminance or daylight factor at calculation points within a proposed space. Appropriate simulation settings must be used. The calculation model should include all the room surfaces, and any surface outside the room that could affect the light received.

Surface reflectance

8. Internal and exterior surfaces and obstructions need to be modelled including appropriate surface reflectances. Fixtures and fittings need not be included. Surface reflectances should represent real conditions.
9. Where reflectance values have not been measured or specified, default values to be used in the calculation are given in Table C4 of the BRE guide, as follows: ceilings, 0.7; interior walls, 0.5; floors, 0.2; exterior walls and obstructions, 0.2; exterior ground, 0.2.

10. Where surface finishes have been specified or measured on site, they can be used in the calculations with appropriate factors for maintenance and furniture. To allow for these factors, maximum reflectances in the calculations should not exceed: white painted surfaces, 0.8 indoors and 0.6 outdoors; light pastel walls, 0.7; light wood floors, 0.4. Surface reflectances used should be presented in the assessment, along with a specification of the materials if non-default reflectances are used.

Glazing transmission

11. Glazing transmission factors, including maintenance factors, need to be included in the simulation along with account for, or modelling of, window framing. Where window frames are not specifically included in the model, frame factors should be applied based on the ratio of glass to overall window aperture area for the type of window to be used; this will generally vary with window size and whether the windows have opening lights. Where window types have not been specified, results for the overall window aperture should be multiplied by a default framing factor as given in Table C5 of the BRE guide, as follows: windows with small panes, 0.5; normal windows with opening lights, 0.6; patio doors, 0.7.
12. For clean, clear double glazing with a low emissivity coating, a value of 0.68 for diffuse transmittance can be used. For other types of glazing, the diffuse transmittance, if needed, can be found by multiplying the manufacturer's normal incidence light transmittance by 0.91. Care needs to be taken to apply the correct values within the calculation software; often software programs use the normal incidence transmittance, which is directly available from the glazing manufacturer, and have inbuilt correction for light coming from oblique angles.
13. An additional maintenance factor also needs to be applied to the glazing transmission to account for dirt on the windows. Full details are given in the National Annex to BS EN 17037. For the more common residential applications, values are given in Table C6 of the BRE guide and reproduced below. These assume the windows will be regularly cleaned.

Table C6 – Maintenance factors for different types of windows		
Type of window	Maintenance factor	
	Rural/suburban	Urban
Vertical, no overhang	0.96	0.92
Vertical, sheltered from rain, e.g. by balcony or overhang	0.88	0.76
Sloping rooflight	0.92	0.84
Horizontal rooflight	0.88	0.76

Assessment grid

14. The daylight calculations need to be carried out on a grid of points on a reference plane within each room assessed. The plane should normally be 0.85m from the floor level (sometimes described as the working plane height). The British Standard states that the assessment grid should exclude a band of 0.5m from the walls, unless otherwise specified. The BRE guide recommends that in dwellings the width of the band to be excluded should be of 0.3 m, to avoid excluding parts of the room that are used by the occupants.
15. The BRE guide advises that professional judgement should be used when setting up the reference plane in irregularly shaped rooms or those with corridor or annex areas. Examples are given in Figures C2 to C5 of the guide and include the following:
- Where room layouts have small variations or alcoves along a wall's length, the inner or dominant section should be taken as a basis for the 0.3m gap to the assessment grid area. Fixed floor to ceiling cupboards can be excluded from the room area, but not kitchen units incorporating a worktop. Areas in bay windows may be included unless they are winter gardens separated from the room by a fixed partition.
 - In a room with a corridor, or annexed entrance, the corridor need not be included in the assessment grid area (unless it is wide enough to be part of the usable space in a room, typically over 1.5m wide). The room layout and surfaces, including the corridor would still need to be included in the calculation model.

- For a combined living/kitchen/ dining area (LKD), the kitchen should always be included as part of the room area in the calculations, even in cases where the kitchen is deemed non-habitable and the living room criterion is applied to the whole space.
16. The British Standard gives an equation for maximum grid spacing. However, for domestic rooms this could potentially give only nine points in the room. The BRE guide therefore recommends a maximum grid spacing of 0.3m and preferably less.
 17. Outdoor and semi-conditioned spaces, partitioned from the room, like balconies and winter gardens should not be included in the reference grid, but the effects of balconies and overhangs above a window should be modelled.

Presentation of results

18. It may not be necessary to analyse every room in a proposed development. For example, if a building has the same room and window layouts on each floor, and rooms on a lower floor meet the recommendations, then the corresponding rooms on upper floors would be expected to meet the recommendations too.
19. For each room, the median illuminance or median daylight factor (exceeded over 50% of the reference plane) should be presented, as this enables comparison with the different recommendations in BS EN 17037.
20. Contour plots showing illuminances or daylight factors throughout the room may also be presented.
21. The proportional area of the reference plane exceeding a particular target value may also be presented. This value is labelled as 'SDA % of Area' on our contour plots. ('SDA' is an acronym for 'spatial daylight autonomy', which is a yearly metric that describes the percentage of room area that receives sufficient daylight according to the specified criteria in a particular standard.)

Sunlight to new dwellings

22. At the site layout stage, the positions of windows may not have been decided. It is suggested that sunlight availability be checked at points 1.6 m above the ground or lowest storey level on each main window wall, and no more than 5 m apart. If the access to sunlight changes rapidly along a façade it is worthwhile trying to site main windows, particularly of living rooms, where most sunlight is available.
23. When calculating the sunlight, the BRE guide advises that:

If window positions are already known, a reference point on the inside face of the window aperture at the centre of the opening width and at least 1.2 m above the floor and 0.3 m above the sill (whichever is the higher) is used. Sunlight blocked by window reveals and balconies or overhangs above the window should not be included, but the effect of window frames and bars can be discounted. Surrounding obstructions should be modelled in detail, and if this is done a minimum solar altitude, as suggested in BS EN 17037, need not apply. 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.

24. In a room with multiple windows, our computer software calculates the total sunlight hours across all its windows without double counting.

Sunlight to new gardens and amenity spaces

25. Sunlight to new amenity spaces within a proposed development should be assessed on the equinox (21 March).
26. As a check, the BRE guide recommends that at least 50% of the area of each amenity space should receive at least two hours of sunlight on 21 March. If a detailed calculation cannot be carried out, and the area is a simple shape, it is suggested that the centre of the area should receive at least two hours of sunlight on 21 March.

27. Sunlight at an altitude of 10° or less does not count, because it is likely to be blocked by low-level planting anyway. In working out the total area to be considered, driveways and hard standing for cars should be left out. Around housing, front gardens that are relatively small and visible from public footpaths should be omitted; only the main back garden should be analysed. Each individual garden for each dwelling in a block should be considered separately.
28. Normally trees and shrubs need not be included, partly because their shapes are almost impossible to predict, and partly because the dappled shade of a tree is more pleasant than the deep shadow of a building (this applies especially to deciduous trees).
29. The guide suggests that shadows of walls or opaque fences greater than 1.5 m high should normally be included in the calculation. Where low fences or walls are intended – or railings or trellises that let through sunlight – no calculation of shadows is necessary.

Glossary of terms

30. The daylight and sunlight terminology used in our report is explained below.

Term	Meaning
Daylight, natural light	Combined skylight and sunlight.
Illuminance	A measure of the amount of light falling on a surface, usually measured in lux.
Diffuse horizontal illuminance (from the sky)	Illuminance produced by skylight on a horizontal surface on the Earth.
Target illuminance	Illuminance from daylight that should be achieved for at least half of annual daylight hours across a specified fraction of the reference plane in a daylit space.
Climate-based daylight modelling	The prediction of daylight illuminance across a grid of points on the working plane inside a room at no greater than hourly intervals in a typical year using hourly climate data for a typical year collected by a weather station near to the site's location and a mathematical model for the spatial distribution of real-world sky luminance (e.g., the Perez All-Weather Sky Model).
Daylight factor	Ratio of total daylight illuminance at a reference point on the working plane within a space to outdoor illuminance on a horizontal plane due to an unobstructed CIE standard overcast sky.
Target daylight factor	Daylight factor value equivalent to the target illuminance to be exceeded for more than half of annual daylight hours over a specified fraction of the reference plane within a daylit space.
CIE standard overcast sky	A theoretical completely overcast sky whose luminance varies with angle of elevation, being three times brighter at the zenith (vertically overhead) than on the horizon, but not with orientation.
Obstruction angle	The angular altitude of the top of an obstruction above the horizontal, measured from a reference point in a vertical plane in a section perpendicular to the vertical plane.
Vertical sky component (VSC)	The amount of daylight falling on a vertical wall or window. It is the ratio of that part of illuminance, at a point on a given vertical plane (e.g. window), that is received directly from a CIE standard overcast sky, to simultaneous illuminance on a horizontal plane due to an unobstructed hemisphere of this sky. The VSC does not include reflected light, either from the ground or from other buildings.

Term	Meaning
	The ratio is usually expressed as a percentage. The maximum value is almost 40% for a completely unobstructed vertical wall.
Reference plane or working plane	Horizontal, vertical, or inclined plane in which a visual task lies. Normally the working plane may be taken to be horizontal, 0.85 m above the floor in housing.
Assessment grid or calculation grid	Grid of calculation points on the reference plane that is used to calculate daylight factor or illuminance from daylight.
Sunlight exposure	Sum of the time (hours) within a given period during which the sun is above the horizon with a cloudless sky, which may be limited by permanent obstructions like mountains, buildings, etc.
Sun on ground (SOG)	The measure of sunlight potential to gardens and amenity spaces. It is measured in hours on the spring equinox (21 March) at a point on the ground accounting for the latitude of the site location. Sunlight below an altitude of 10° is usually discounted as it is likely to be prevented from reaching the ground by fences, plants or other low-level obstructions.

Appendix 2

Location drawings

Site location plan
Plan & 3D view drawings



Plan View



3D View 01

3D View 02

NO DIMENSIONS TO BE SCALED FROM THIS DRAWING

KEY:

Existing

Proposed

Cutback Envelope

Consented

Cumulative

SOURCE DATA:

Existing and surrounding buildings

(source): Buckley Gray Yeoman

Dwg No's: 250109_AvonsideFeasoModel

.DWG

existing model.DWG

Proposed scheme

(Architect) Buckley Gray Yeoman

3D model received (28.05.2025)

Dwg No's:

buckleygrayyeoman_1207-ga-00-a-g-pdf_

2025-05-23_1608 .zip

1207-GA-00 (A-G)-.dwg

1207-GA-01 (A-G)-.dwg

1207-GA-02 (A-G)-.dwg

1207-GA-03 (A-G)-.dwg

1207-GA-RF (A-G)-.dwg

1207-GE-05-09.dwg

1207-GS-01-09.dwg

NOTES:

All heights given in m AOD

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TITLE:

AVONSIDE

MELKSHAM

SN12 8BT

DRAWING:

PROPOSED SCENARIO

Plan and 3D Views

DRAWN: CC	JOB NBR:
SCALE: NTS	25060
DATE: 04.06.2025	
DWG NO:	REV:
S02-A01-PR-001	

Appendix 3

Daylight and sunlight results for proposed dwelling



F01 -Plan View

NO DIMENSIONS TO BE SCALED FROM THIS DRAWING

KEY:

Median illuminance (lux)
EN 17037

≥ 300

≥ 200

≥ 150

≥ 100

< 100

SOURCE DATA:

Existing and surrounding buildings
(source): Buckley Gray Yeoman
Dwg No's: 250109_AvonsideFeasoModel
.DWG
existing model.DWG

Proposed scheme
(Architect) Buckley Gray Yeoman
3D model received (28.05.2025)
Dwg No's:
buckleygrayyeoman_1207-ga-00-a-g-pdf_2025-05-23_1608 .zip
1207-GA-00 (A-G)-.dwg
1207-GA-01 (A-G)-.dwg
1207-GA-02 (A-G)-.dwg
1207-GA-03 (A-G)-.dwg
1207-GA-RF (A-G)-.dwg
1207-GE-05-09.dwg
1207-GS-01-09.dwg

NOTES:

Illuminance level calculated in accordance with the BRE guide 2022:
"A space is considered to provide adequate daylight if a target illuminance level is achieved across a 50% of the space for at least half of the daylight hours (4,380) in the year."
SDA presents percentage of area achieves the target illuminance (lux) for at least half of daylight hours.

Reflectance List

Ground Plane	0.20
Surrounding Buildings	0.20
Proposed Building	0.20
Internal Walls	0.70
Internal Floors	0.40
Internal Ceilings	0.80

Rev	Description	Drawn	Date

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TITLE:

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Melksham
SN12 8BT

DRAWING:

DAYLIGHT ILLUMINANCE STUDY
Plan View

DRAWN: CC	JOB NBR:
SCALE: NTS	25060
DATE: 02.06.2025	
DWG NO:	REV:

S02-A01-IDS-001



NO DIMENSIONS TO BE SCALED FROM THIS DRAWING

KEY:

Median illuminance (lux)
EN 17037

	≥ 300
	≥ 200
	≥ 150
	≥ 100
	< 100

SOURCE DATA:

Existing and surrounding buildings
(source): Buckley Gray Yeoman
Dwg No's: 250109_AvonsideFeasoModel
.DWG
existing model.DWG

Proposed scheme
(Architect) Buckley Gray Yeoman
3D model received (28.05.2025)
Dwg No's:
buckleygrayyeoman_1207-ga-00-a-g-pdf_2025-05-23_1608 .zip
1207-GA-00 (A-G)-.dwg
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1207-GA-03 (A-G)-.dwg
1207-GA-RF (A-G)-.dwg
1207-GE-05-09.dwg
1207-GS-01-09.dwg

NOTES:

Illuminance level calculated in accordance with the BRE guide 2022:
"A space is considered to provide adequate daylight if a target illuminance level is achieved across a 50% of the space for at least half of the daylight hours (4,380) in the year."
SDA presents percentage of area achieves the target illuminance (lux) for at least half of daylight hours.

Reflectance List

Ground Plane	0.20
Surrounding Buildings	0.20
Proposed Building	0.20
Internal Walls	0.70
Internal Floors	0.40
Internal Ceilings	0.80

Rev	Description	Drawn	Date



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DRAWING:

DAYLIGHT ILLUMINANCE STUDY
Plan View

DRAWN: CC	JOB NBR:
SCALE: NTS	25060
DATE: 02.06.2025	
DWG NO:	REV:
S02-A01-IDS-001	

F02 - Plan View



NO DIMENSIONS TO BE SCALED FROM THIS DRAWING

KEY:

Median illuminance (lux)
EN 17037

- ≥ 300
- ≥ 200
- ≥ 150
- ≥ 100
- < 100

SOURCE DATA:

Existing and surrounding buildings
(source): Buckley Gray Yeoman
Dwg No's: 250109_AvonsideFeasoModel
.DWG
existing model.DWG

Proposed scheme

(Architect) Buckley Gray Yeoman
3D model received (28.05.2025)
Dwg No's:
buckleygrayyeoman_1207-ga-00-a-g-pdf_
2025-05-23_1608 .zip
1207-GA-00 (A-G)-.dwg
1207-GA-01 (A-G)-.dwg
1207-GA-02 (A-G)-.dwg
1207-GA-03 (A-G)-.dwg
1207-GA-RF (A-G)-.dwg
1207-GE-05-09.dwg
1207-GS-01-09.dwg

NOTES:

Illuminance level calculated in accordance
with the BRE guide 2022:
"A space is considered to provide adequate
daylight if a target illuminance level is
achieved across a 50% of the space
for at least half of the daylight hours (4,380)
in the year."
SDA presents percentage of area achieves
the target illuminance (lux) for at least half
of daylight hours.

Reflectance List

Ground Plane	0.20
Surrounding Buildings	0.20
Proposed Building	0.20
Internal Walls	0.70
Internal Floors	0.40
Internal Ceilings	0.80

Rev	Description	Drawn	Date



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DRAWING:

DAYLIGHT ILLUMINANCE STUDY
Plan View

DRAWN: CC	JOB NBR:
SCALE: NTS	25060
DATE: 02.06.2025	
DWG NO:	REV:
S02-A01-IDS-001	

Property & room attributes					BRE 2022				
Floor	Flat/Unit no.	Room ref.	Property type	Room use	Daylight illuminance			Sun exp.	
					Target (lx)	Result (lx)	% area ≥target	(Hrs)	Flat/unit satisfies?

Avonside Enterprise Park									
F01	Flat 01	R1	Residential	LKD	150	272	73%	0.0	
	Flat 01	R2	Residential	Bedroom	100	225	100%	0.0	No
	Flat 02	R3	Residential	LKD	150	481	100%	3.2	
	Flat 02	R4	Residential	Bedroom	100	418	100%	3.2	Yes
	Flat 03	R5	Residential	LKD	150	493	100%	7.7	
	Flat 03	R6	Residential	Bedroom	100	255	100%	5.1	
	Flat 03	R7	Residential	Bedroom	100	330	100%	5.8	Yes
	Flat 04	R8	Residential	Bedroom	100	274	100%	6.0	
	Flat 04	R9	Residential	Bedroom	100	212	100%	4.2	
	Flat 04	R10	Residential	LKD	150	694	100%	6.9	Yes
	Flat 05	R11	Residential	LKD	150	324	100%	0.0	
	Flat 05	R12	Residential	Bedroom	100	359	100%	0.0	No
	Flat 06	R13	Residential	Bedroom	100	447	100%	0.0	
	Flat 06	R14	Residential	Bedroom	100	155	100%	0.0	
	Flat 06	R15	Residential	LKD	150	842	100%	2.3	Yes
	Flat 07	R16	Residential	Bedroom	100	442	100%	2.3	
	Flat 07	R17	Residential	LKD	150	198	64%	2.3	Yes
	Flat 08	R18	Residential	LKD	150	1149	100%	7.3	
	Flat 08	R19	Residential	Bedroom	100	553	100%	7.3	Yes
	Flat 09	R20	Residential	Bedroom	100	600	100%	7.3	
	Flat 09	R21	Residential	LKD	150	655	100%	7.3	Yes
F02	Flat 10	R1	Residential	LKD	150	269	83%	0.0	
	Flat 10	R2	Residential	Bedroom	100	263	100%	0.0	No
	Flat 11	R3	Residential	Bedroom	100	281	100%	0.0	
	Flat 11	R4	Residential	Bedroom	100	662	100%	3.3	
	Flat 11	R5	Residential	LKD	150	577	100%	8.5	Yes
	Flat 12	R6	Residential	LKD	150	338	100%	0.0	
	Flat 12	R7	Residential	Bedroom	100	471	100%	0.0	No
	Flat 13	R8	Residential	Bedroom	100	424	100%	0.0	
	Flat 13	R9	Residential	LKD	150	869	100%	2.3	Yes
	Flat 14	R10	Residential	Bedroom	100	475	100%	2.3	
	Flat 14	R11	Residential	LKD	150	196	62%	2.3	Yes
	Flat 15	R12	Residential	LKD	150	1087	100%	7.3	
	Flat 15	R13	Residential	Bedroom	100	515	100%	7.3	Yes
	Flat 16	R14	Residential	Bedroom	100	547	100%	7.3	
	Flat 16	R15	Residential	LKD	150	610	100%	7.3	Yes
F03	Flat 17	R1	Residential	LKD	150	376	100%	0.0	
	Flat 17	R2	Residential	Bedroom	100	513	100%	0.0	No
	Flat 18	R3	Residential	Bedroom	100	466	100%	0.0	
	Flat 18	R4	Residential	LKD	150	889	100%	2.3	Yes
	Flat 19	R5	Residential	Bedroom	100	481	100%	2.3	



Property & room attributes					BRE 2022				
Floor	Flat/Unit no.	Room ref.	Property type	Room use	Daylight illuminance			Sun exp.	
					Target (lx)	Result (lx)	% area ≥target	(Hrs)	Flat/unit satisfies?
	Flat 19	R6	Residential	LKD	150	203	63%	2.3	Yes
	Flat 20	R7	Residential	LKD	150	1107	100%	7.3	
	Flat 20	R8	Residential	Bedroom	100	520	100%	7.3	Yes
	Flat 21	R9	Residential	Bedroom	100	556	100%	7.3	
	Flat 21	R10	Residential	LKD	150	606	100%	7.3	Yes

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