



DAYLIGHT & SUNLIGHT

INTERNAL DAYLIGHT AND
SUNLIGHT REPORT

2C Landrock road

Mr Fawad Karimi

28 July 2023

GIA No: **18480**

PROJECT DATA:

Client **Mr Fawad Karimi**
Architect **HSSP Architects**
Project Title **2C Landrock road**
Project Number **18480**

REPORT DATA:

Report Title **Internal Daylight and Sunlight Assessment**
GIA Department **Daylight Department**
Dated **28 July 2023**

Prepared by **VSM**
Checked by **NH**
Type **Planning**

Revisions	No:	Date:	Notes:	Signed:

DISCLAIMER:

N.B This report has been prepared for Mr Fawad Karimi by GIA as their appointed Daylight & Sunlight consultants. This report is intended solely for Mr Fawad Karimi and may contain confidential information. No part or whole of its contents may be disclosed to or relied upon by any Third Parties without the express written consent of GIA. It is accurate as at the time of publication and based upon the information we have been provided with as set out in the report. It does not take into account changes that have taken place since the report was written nor does it take into account private information on internal layouts and room uses of adjoining properties unless this information is publicly available.

SOURCES OF INFORMATION:

Information Received **IR-02-05-18480**
Release Number **Rel_01_18480_DSD**
Issue Number **02**
Site Photos **GIA**
3D models **VU.CITY**
OS Data **FIND Maps**



© Crown copyright and database rights 2017.
OS 100047514

CONTENTS

USER TIP:

Click any heading to go directly to that content.

1	EXECUTIVE SUMMARY	2
2	INTRODUCTION	3
3	BRE GUIDELINES	4
4	SIMULATION ASSUMPTIONS	8
5	CONCLUSIONS	9
6	SITE OVERVIEW	10
7	INTERNAL DAYLIGHT AND SUNLIGHT ASSESSMENTS	12

USER TIP:

Return to the contents list from any page by clicking on the GIA logo.

1 EXECUTIVE SUMMARY

GIA has been instructed by HSSP Architects to provide a Daylight and Sunlight report for the residential accommodation within the proposed development at 2C Landrock road, London Borough of Haringey.

This report contains the final assessments undertaken for all the proposed habitable rooms according to the methodology and criteria set out in the BRE guidelines 'Site Layout Planning for Daylight and Sunlight a Guide to Good Practice (2022)' and EN 17037:2018 and relative UK National Annex.

For daylight, two out of four assessed habitable rooms within the proposed development achieve the minimum levels of spatial Daylight Autonomy (sDA) recommended within the UK National Annex for residential buildings. These rooms correspond to a kitchen-dining space located in the upper level of the dwelling (lower ground floor) and to a living room area located in the basement.

As is to be expected in any urban environment, lower levels of daylight are typically seen on the lowest floors or where rooms are located beneath a balcony or an overhang. In this case, for the two bedrooms located in the basement floor, daylight availability is significantly restricted as a result of the obstruction from the fencing of the proposed dwelling and the overhang from the balcony in the upper level (lower ground floor). More details can be found in Section 07.

With regard to sunlight, the proposed dwelling would meet the criterion of at least one habitable room receiving at least 1.5 hours of sunlight on 21st March. Moreover, both the kitchen-dining area in the upper level and the living room area in the basement would receive well above the recommended 1.5 hours of sunlight on the 21st March.

In conclusion, the assessments have demonstrated that the proposed dwelling will be provided with very good sunlight amenity in the main habitable spaces. In terms of daylight, while the two bedrooms are also falling short of the recommended values, the proposed residential will be provided with good daylight levels in the main habitable spaces. Overall, the scheme is considered to provide reasonable in context levels of daylight and sunlight.

2 INTRODUCTION

GIA has been instructed to provide a report upon the potential availability of Daylight and Sunlight to the proposed accommodation within the residential scheme prepared by HSSP Architects.

For the preparation of this report GIA has therefore undertaken the following:

- To create a 3D computer model of the proposal based upon drawings prepared by HSSP Architects.
- Carry out a daylight quantum assessment of the proposed residential accommodation using the Illuminance (Spatial Daylight Autonomy/sDA) methodology set out in the BRE Guidelines 2022.
- Carry out a sunlight quantum assessment of the proposed residential accommodation using the Sun Exposure on 21st March methodology set out in the BRE Guidelines 2022.
- Prepare a report setting out the analysis and our findings.

3 BRE GUIDELINES

The Building Research Establishment (BRE) have set out in their handbook 'Site Layout Planning for Daylight and Sunlight a Guide to Good Practice (BR 209 2022)', guidelines and methodology for the measurement and assessment of daylight and sunlight within proposed buildings.

3.1 INTRODUCTION

The BRE published the new edition of 'Site layout planning for daylight and sunlight: a guide to good practice' in June 2022 (BR 209). This is to be read in conjunction with BS EN 17037:2018 "Daylight in buildings", the UK National Annex of the British Standard and the CIBSE publication LG 10 'Daylighting – a guide for designers'.

The BR 209 new edition contains amended methodologies for appraising the daylight and sunlight quality within new developments. Nonetheless, the main aim of the guidance is maintained: *"to help rather than constrain the designer"* as stated in Paragraph 1.5 of the new guidance.

The report provides advice, but also clearly states that it *"is not mandatory and the guide should not be seen as an instrument of planning policy."* The guidance also acknowledges in its introduction that *"Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design (see Section 5). 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."* (Paragraph 1.6)

3.2 BS EN 17037:2018 AND THE UK ANNEX

The British Standard BS8206-2:2008 was superseded by the new European Standard on daylight BS EN 17037:2018 "Daylight in buildings".

Following on from the review of the European Standard by a dedicated commission of UK experts, the British Standard Institution appended to BS EN 17037:2018 a UK National Annex which brings the recommended light levels in line with those of the former BS8206-2:2008.

The BS EN 17037 includes four criteria: daylighting, views, sunlight access and glare. Daylighting and sunlight access are considered relevant for residential buildings and therefore discussed within this report.

View out and Glare are not solely but mostly relevant in offices and schools, where occupants are more fixed to a certain location within a room. In residential habitable rooms, occupants tend to move more freely and therefore view out and glare are not assessed within residential buildings.

In relation to sunlight access, the assessment considers the hours of sunlight reaching a window on the 21st March.

3.3 DAYLIGHT

The BRE set out the methods for assessing daylight within a proposed building within section 2.1 and Appendix C of the handbook. This is based on the methods detailed in the BS EN 17037.

BS EN 17037 suggests two possible methodologies for appraising daylight:

- Illuminance Method
- Daylight Factor Method

These methodologies are discussed in more detail below.

Whilst Vertical Sky Component (VSC) is no longer directly used to calculate the levels of daylight indoors, this is still referenced within the BRE guidance as a metric to appraise the level of obstruction faced by a building and the potential for good daylight indoors.

This method of assessment may also be used to appraise the daylight quality in the early stages of the design, when room layouts or window locations are still undecided.

Vertical Sky Component (VSC)

This method of assessment can be undertaken using a skylight indicator or a Waldram diagram manually or most commonly through the use of specialist daylighting software. It measures from a single point, at the centre of the window (if known at the early design stage), the quantum of sky visible taking into account all external obstructions. Whilst these obstructions can be either other buildings or the general landscape, trees are usually ignored unless they form a continuous or dense belt of obstruction.

The VSC method is a useful 'rule of thumb' but has some significant limitations in determining the true quality of daylight within a proposed building. It does not take into account the size of the window, any reflected light off external obstructions, any reflected light within the room, or the use to which that room is put.

Illuminance method

Climate Based Daylight Modelling (CBDM) is used to predict daylight illuminance using sun and sky conditions derived from standard meteorological data (often referred to as climate or weather data). This analytical method allows the prediction of absolute daylight illuminance based on the location and building orientation, in addition to the building's daylight systems (shading systems, for example). Annex A within the BS EN 17037 proposes values of target illuminances and minimum target illuminances to exceed 50 % of daylight hours.

This is considered to be the most accurate approach when using climate data, however, it provides a very large amount of data for each assessed room, which then needs to be interrogated. One of the methodologies that can be used to interrogate this data is Spatial Daylight Autonomy (sDA).

Spatial Daylight Autonomy (sDA)

The sDA assessment is designed to understand how often each point of the room's task area sees illuminance levels at or above a specific threshold.

BS EN 17037 sets out minimum illuminance levels (300lx) that should be exceeded over 50% of the space for more than half of the daylight hours in the year. It also includes recommendations for medium and high daylighting levels within a space (500lx and 700lx respectively). It should be noted here, however, that these targets are specified irrespective of a space's use or design.

The National Annex suggests that these targets can be challenging to achieve within residential settings, particularly in areas of higher density and so suggests lower targets can be considered in this situation. It should be noted here that the reduced targets suggested within the BS EN 17037:2018 National Annex are provided so as to be comparable with the previous BR209's recommendations for ADF. These targets are:

- 100 lux for bedrooms
- 150 lux for living rooms
- 200 lux for living/kitchen/diners, kitchens, and studios.

It is however stated in paragraph C17 of the BRE that: *"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. Local authorities could use discretion here. For example, the target for*

a living room could be used for a combined living/dining/kitchen area if the kitchens are not treated as habitable spaces, as it may avoid small separate kitchens in a design".

Daylight Factor method

This method involves calculating the median daylight factor on a reference plane (assessment grid).

"The daylight factor is the illuminance at a point on the reference plane in a space, divided by the illuminance on an unobstructed horizontal surface outdoors. The CIE standard overcast sky is used, and the ratio is usually expressed as a percentage."

This method of assessments considers an overcast sky, and therefore the orientation and location of buildings is not relevant. In order to account for different climatic conditions, Annex A within the BS EN 17037 sets equivalent daylight factor targets (D) for various locations in Europe.

The median daylight factor (MDF) should meet or exceed the target daylight factor relative to a given illuminance for more than half of daylight hours, over 50% of the reference plane.

3.4 SUNLIGHT

The BRE provide guidance in respect of sunlight quality for new developments within section 3.1 of the handbook. It is generally acknowledged that the presence of sunlight is more significant in residential accommodation than it is in commercial properties, and this is reflected in the BRE document.

It states, *"in housing, the main requirement for sunlight is in living rooms, where it is valued at any time of the day, but especially in the afternoon. Sunlight is also required in conservatories. It is viewed as less important in bedrooms and in kitchens where people prefer it in the morning rather than the afternoon."*

The BRE guide considers the critical aspects of orientation and overshadowing in determining the availability of sunlight at a proposed development site.

The guide proposes minimising the number of dwellings whose living room face solely north unless there is some compensating factor such as an appealing view to the north, and it suggests a number of techniques to do so. Furthermore, it discusses massing solutions with a sensitive approach to overshadowing, so as to maximize access to sunlight.

At the same time, it acknowledges that the site's existing urban environment may impose orientation or overshadowing constraints which may not be possible to overcome.

To quantify sunlight access for interiors where sunlight is expected, it refers to the BS EN 17037 criterion that the minimum duration of sunlight exposure in at least one habitable room of a dwelling should be 1.5 h on March 21st. Table A.5 also establishes medium and high sunlight targets (3 and 4 hours).

This is to be checked at a reference point located centrally to the window's width and at the inner surface of the aperture (façade and/or roof). For multiple apertures in different façades it is possible to cumulate the time of sunlight availability if not occurring at the same time. The reference point is minimum 1.2 m above the floor and 0.3 m above the window sill if present.

The summary of section 3.1 of the guide states as follows:

"In general, a dwelling or non-domestic building which has a particular requirement for sunlight, will appear reasonably sunlit provided that:

- *At least one main window faces within 90 degrees 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 counted.. "*

3.5 FURTHER RELEVANT INFORMATION

CIBSE LG 10 'Daylighting – a guide for designers'.

This guide details the process of designing for daylighting. It outlines considerations of form, orientation, and other aspects involved in designing the building envelope to optimise natural light.

The guidance in this document is written primarily for buildings located within the UK, and will be most applicable to projects in northern hemisphere. However, the principles are universal, and can be applied to other locations if the appropriate weather data is used and local standards and regulations are respected

4 SIMULATION ASSUMPTIONS

In order to undertake the daylight and sunlight assessments set out in the previous pages, we have prepared a three dimensional computer model and used specialist lighting simulation software.

Calculation model

The three dimensional representation of the proposed development has been modelled using the drawings prepared by HSSP Architects. These have been placed in the context of their surrounding buildings which have been modelled from survey information, photogrammetry, OS and site photographs. This allows for a precise model, which in turn ensures that analysis accurately represents the amount of daylight and sunlight available to the building façades, internal and external spaces, considering all of the surrounding obstructions and orientation.

The weather file recorded at Gatwick Airport was considered the most relevant for this assessment.

Surfaces reflectance

In general, the reflectance value to be applied to surfaces in the computational modelling follows the BR 209 Annex C, unless specified by the design team. Assumptions applied are:

- Interior walls - 0.7
- Interior ceilings - 0.8
- Exterior ceilings - 0.6
- Floors - 0.4
- Exterior ground and external obstructions - 0.2

Assessment Grids

For the daylight assessments, an analysis 'grid' is located within each room at working plane height (850 mm from FFL) and offset by 0.3m from the walls as recommended by BR 209.

Grid points are spaced by 0.2m .

Assessment Resolution

The climate-based daylight assessments have been undertaken on an hourly basis whilst the sunlight exposure assessment has been undertaken for every minute on the relevant days.

Glazing transmittance

A glazing visible light transmittance (VLT) of 75% has been used as in agreement with the design team. A framing factor has been taken from the elevations supplied. Maintenance factors have been applied as per BR209 with 0.92 for windows not beneath an overhang and 0.76 for windows beneath an overhang and horizontal rooflights.

The final transmittance values are shown in the table below.

GLAZING TYPE:	TV (Normal)	FRAMING FACTOR	MAINT. FACTOR	TV (Total)
x_Glz75_UCVF75	0.75	0.75	0.92	0.52
x_Glz75_UCHF75	0.75	0.75	0.76	0.43
x_Glz75_UCVF85	0.75	0.85	0.92	0.59
x_Glz75_UCOF75	0.75	0.75	0.76	0.43
x_Glz75_UCHF75	0.75	0.90	0.76	0.51

Table 01: Transmittance and maintenance factors

5 CONCLUSIONS

The proposed development entails the erection of a new dwelling, consisting of two levels (lower ground floor and basement) that include two bedrooms, a living room, a kitchen-dining area and two outdoor amenity spaces (a balcony and a courtyard).

5.1 CONCLUSIONS ON DAYLIGHT

In order to ascertain the levels of daylight and sunlight within the proposed scheme, technical assessments have been undertaken within all proposed habitable rooms.

All proposed habitable rooms have been tested for spatial Daylight Autonomy (sDA) according to the targets set out in the UK National Annex of the BS EN 17037:2018, which sets illuminance targets (measured in lux) to be achieved for over 50% of the space for more than half of the daylight hours in the year.

The internal daylight assessment results can be found within Section 07 of this report.

Overall, two out of four proposed habitable rooms achieve the minimum levels of spatial Daylight Autonomy (sDA) recommended within the UK National Annex for residential buildings. These results consider 200 lux for kitchens, 150 lux for living rooms and 100 lux for bedrooms.

The two rooms seeing lower levels of daylight are located in the basement floor where a higher level of obstruction naturally occurs. One of the main constraints in these spaces is the private outdoor amenity (balcony), which reduces light ingress by acting as an overhang.

In conclusion, the scheme will provide reasonable in context daylight amenity on balance.

5.2 CONCLUSIONS ON SUNLIGHT

For sunlight, all habitable rooms have been assessed for solar exposure, for which the recommendation is for each dwelling to have at least one habitable room (preferably a living room) receiving a total of at least 1.5 hours of sunlight on 21st March.

The internal sunlight assessment results can be found within Section 07 of this report.

The proposed dwelling meets the criterion of at least one habitable room receiving at least 1.5 hours of sunlight on 21st March. Furthermore, both the kitchen-dining in the upper floor and the living space in the basement achieve values well above the aforementioned target.

In conclusion, the scheme will provide very good sunlight amenity throughout.

6 SITE OVERVIEW



Fig. 01: Top view



Fig. 02: Perspective view

7 INTERNAL DAYLIGHT AND SUNLIGHT ASSESSMENTS

BasementFloor

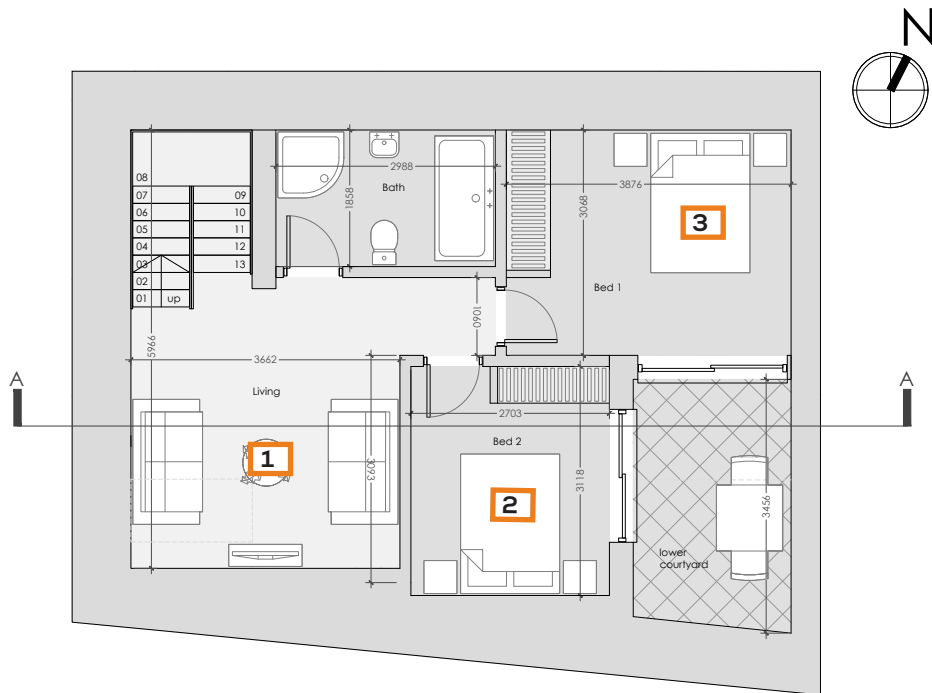
		DAYLIGHT					SUNLIGHT		
ROOM REF.	ROOM USE	EN SPATIAL DAYLIGHT AUTONOMY percentage of room achieving target illuminance for 2190 hrs (50% of daylit hours)					HOURS:MIN		
		100	150	200	TARGET	RELEVANT ENSDA	1 FEB	25 FEB	21 MAR
BLOCKA - LEVEL -01									
1	LIVING ROOM	84.1	72.7	58.5	150	72.7	05:55	07:41	08:01
2	BEDROOM	11.4	3.8	0.0	100	11.4	00:00	00:00	00:00
3	BEDROOM	0.0	0.0	0.0	100	0.0	00:00	00:00	01:02

Table 01: Assessment Data

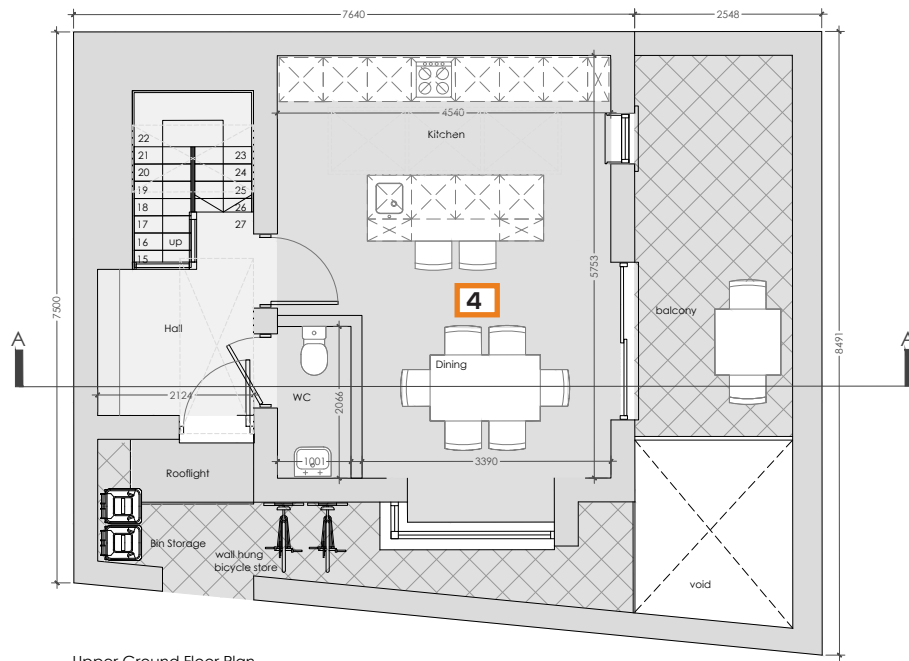
Lower Ground Floor

		DAYLIGHT					SUNLIGHT		
ROOM REF.	ROOM USE	EN SPATIAL DAYLIGHT AUTONOMY percentage of room achieving target illuminance for 2190 hrs (50% of daylit hours)					HOURS:MIN		
		100	150	200	TARGET	RELEVANT ENSDA	1 FEB	25 FEB	21 MAR
BLOCKA - LEVEL 00									
4	KITCHEN-DINING	100.0	100.0	100.0	200	100.0	07:05	08:41	09:26

Table 01: Assessment Data



Basement Floor Plan



Upper Ground Floor Plan

Fig. 03: Floor Plan





For further details please contact us on:

LONDON

T 020 7202 1400

E mail@gia.uk.com

The Whitehouse
Belvedere Road
London SE1 8GA

MANCHESTER

T 0161 672 5100

E manchester@gia.uk.com

2 Commercial Street
Manchester
M15 4RQ

BELFAST

T 02892 449 674

E belfast@gia.uk.com

River House
48-60 High Street
Belfast BT1 2BE

BRISTOL

T 0117 374 1504

E bristol@gia.uk.com

33 Bristol
Colston Avenue
Bristol BS1 4UA

DUBLIN

T 020 7202 1400

E hello@giasurveyors.ie

77 Lower Camden Street
Dublin Ireland
D02 XE80