Est. 1980

PREECE HOUSE, 91-103 DAVIGDOR ROAD, HOVE, BN3 1RE

Internal Daylight Report

January 2024

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PROJECT INFORMATION

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Job No:	23178
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Version	Date	Details
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APPENDICES

1. Introduction

1.1. Delva Patman Redler LLP have been engaged by the Applicant to assess daylight and sunlight provision to the new dwellings and amenity spaces within the proposed development at Preece House, Davigdor Road ("the Site"). This report has been prepared to accompany the Applicant's planning application.

1.2. The Site is shown central to the aerial photograph in Figure 1 below and on the location plan in Appendix 2.

Figure 1 - Aerial photo of the Site and neighbouring buildings (© Google)

1.3. The Site is located within the Brighton & Hove City Council boundary.

1.4. The proposed configuration of the 1st floor is illustrated in the plan view drawing in Appendix 2. The application under Class MA, Part 3 of the GPDO 2015 (as amended) comprises the conversion and refurbishment of the first floor of the existing building to provide nine residential units.

1.5. Our daylight and sunlight study has been carried out using the assessment methodology recommended in the Building Research Establishment (BRE) Report 209, *'Site Layout Planning for Daylight and Sunlight: A guide to good practice'* (third edition, 2022) ("the BRE guide") and the Professional Guidance Note, *'Daylighting and sunlighting'* (1st edition, 2012), published by the Royal Institution of Chartered Surveyors.

1.6. This report is accompanied by the Appendices listed on the Contents page, including an explanation of the BRE assessment methodology, a glossary of technical terms, drawings, and tabulated results.

2. Planning policy and guidance

National Planning Policy and Guidance

National Planning Policy Framework (July 2021)

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 125 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).*

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

2.4. The leading publication providing national guidance on the provision of daylight and sunlight to new development, and the impacts of development on daylight and sunlight to neighbouring buildings and open spaces, is BRE Report 209, '*Site Layout Planning for Daylight and Sunlight: A guide to good practice*' (third edition,2022). It is referred to in the development plan documents or supplementary planning documents of most planning authorities.

2.5. The BRE guide states:

> *This guide gives advice on site layout planning to achieve good daylighting and sun lighting, within buildings and in the open spaces between them.*
>
> *(Its) main aim is … to help to ensure good conditions in the local environment, considered broadly, with enough sunlight and daylight on or between 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 report should not be seen as a part of planning policy. Its aim is to help rather than constrain the designer.*
>
> *Although it gives numerical guidelines, these should be interpreted flexibly because natural lighting is only one of the many factors in site layout design.*
>
> *In special circumstances the developer or planning authority may wish to use different target values.*

General Permitted Development Order (GDPO)

2.6. The General Permitted Development Order (GPDO) requires prior approval applications to be assessed only in relation to certain defined issues and must only have regard to the NPPF, so far as relevant to those defined matters. In respect of the provision of adequate natural light, NPPF policy 130(f) states that decisions should

> *"create places that are safe, inclusive and accessible and which promote health and well-being, with a high standard of amenity for existing and future users.."*

3. 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 methodology recommended in the BRE guide.

3.2. The principal assessments and numerical criteria are summarised below. A fuller explanation of the assessment methodology is given at Appendix 1 of this report.

3.3. The BRE guide (third edition, 2022) is intended to be used in conjunction with the interior daylighting recommendations in BS EN17037:2018 *Daylight in buildings,* and in the CIBSE publication *LG 10 Daylighting - a guide to designer.* The BRE guide is the leading publication providing national guidance and is referred to in development plan documents or supplementary planning documents of most planning authorities. We have therefore followed the assessment methodology in the BRE guide.

Daylight to new dwellings

3.4. Daylight provision in new rooms may be checked using either of the methods described in the BRE guide 2022, direct prediction of 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.

3.5. The Illuminance method is more useful, informative and accurate as it is dependent on both geographic location and orientation of the building. Therefore, we undertake our technical assessment using illuminance method.

3.6. The illuminance method requires a 3d model of the space together with the key parameters such as nearby obstructions, the assigned internal and external surface reflectance values, diffuse glazing transmittance, and maintenance factors for the dirt that are a reasonable representation of those for the actual, completed building.

3.7. The minimum recommended target illuminance level (lux) for room types in UK dwellings is 100 lux for bedrooms, 150 lux for living rooms and 200 lux for kitchens. Bathrooms, stairwells and other circulation areas with less than 1.5m wide need not be assessed.

3.8. The guide recommends the target illuminance for the room type with the highest value should be taken where one room in a UK dwelling serves more than a single purpose - for example, in a space that combines a living room and a kitchen the target illuminance is recommended to be 200 lux. T

3.9. The BRE guide also advises that 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. The kitchen space should still need to be included in the assessment area. In this case the target illuminance level of 150 lux or more might be acceptable...

3.10. The GPDO requires an assessment of natural light to habitable rooms. Habitable rooms are defined in the GPDO as meaning:-

> *"..any rooms used or intended to be used for sleeping or living which are not solely used for cooking purposes, but does not include bath or toilet facilities, service rooms, corridors, laundry rooms, hallways or utility rooms".*

3.11. Therefore, for the purposes of this assessment it is not necessary to assess the separate, cooking-only kitchens.

3.12. Therefore, for the purposes of this assessment it is not necessary to assess the separate, cooking-only kitchens.

4. Scope of the internal assessment

4.1. Within the proposed development, we have assessed daylight to all relevant habitable rooms on all relevant floors.

5. Information used in our technical study

5.1. We have undertaken our technical study using a 3D computer model built in AutoCAD and specialist analysis software, which runs the assessments recommended in the BRE guide.

5.2. We compiled our 3D computer model from the following information:

5.2.1. 3D computer model of the contextual massing surrounding the Site produced from photogrammetry (aerial photography) supplied by AccuCities Ltd, subsequently enhanced by us using measured survey point cloud produced by our in-house measured survey team in April 2023

5.2.2. Adjacent consented schemes modelled in accordance with drawing information obtained from local authority planning portal

5.2.3. Proposed development: 2D floor plans supplied by MCL Architecture on 09 January 2024

Dwg No': 2228-PH-P-70-01-01-06-P2

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 – Proposed Dwellings
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
Internal surface reflectance	0.8 for white ceilings 0.7 for pale cream walls 0.4 for light wood floors

Limitations and assumptions

5.3. 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.

5.4. We have used proven and trusted specialist computer software (Waldram Tools for AutoCAD®) to run the calculations recommended in the BRE guide.

5.5. 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.

6. Results of internal daylight assessment

Daylight to new dwellings

Daylight illuminance

6.1. The results of the illuminance method for the assessed proposed dwellings are set out in the table of results and floor plans at Appendix 3. The level of adherence to the BRE numerical guidelines is summarised in Table 2 below.

Table 2 *– Summary of Daylight illuminance results*

Building	Room use	No. of rooms tested	Daylight illuminance		
			Meeting min. target		No. below min. target
			No.	%	
Preece House					
	Bedroom	10	10	*100%*	0
	LKD	9	9	*100%*	0
	Totals:	**19**	**19**	***100%***	**0**

6.2. Table 2 shows that all 19 (100%) of the rooms assessed within the proposed scheme would comfortably satisfy the BRE guidelines for internal daylight illuminance.

7. Conclusion

7.1. The Site is in an urban location between Brighton and Hove train stations.

7.2. We assessed the daylight provision to all relevant habitable rooms within the proposed development.

7.3. We ran our assessments using methodologies recommended in the BRE guide.

7.4. The internal daylight analysis demonstrates that all rooms assessed will comfortably achieve the target criteria.

7.5. In conclusion, it is submitted that the layout of the proposed development meets the requirements of the Class MA Part 3 of the General Permitted Development Order (2015) in relation to the provision of adequate natural light, as well as paragraph 130(f) of the National Planning Policy Framework.

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Appendix 1

Assessment methodology and glossary

1. This appendix explains the daylight and sunlight assessment methodology recommended in BRE Report 209, *'Site Layout Planning for Daylight and Sunlight: A guide to good practice'* (2022) and provides a glossary of the terminology used.

Assessment methodology

Daylight in new development

Daylight to new dwellings

*Vertical sky component (**VSC**)*

2. At the very early stages in design and at outline planning application stage, when room layouts and window locations may be undecided, daylight availability may be checked by calculating the VSC at a series of points on each main face of the building.

3. Although the BRE guide recommends setting the calculation points at 1.6 m above the ground (or base of the lowest storey) and no more than 5 m apart, with computer software it is possible to set up a grid of points across the facades.

4. The guide advises that if the VSC is found to change rapidly along a façade it is worthwhile, if possible, siting windows where most daylight is available.

5. The amount of daylight a room needs depends on what it is being used for. But roughly speaking, if the VSC is:

    - at least 27% (obstruction angle less than 25˚), conventional window design will usually give reasonable results;
    - between 15% and 27% (obstruction angle between 25˚and 45˚), special measures (for example, larger windows or changes to room layout) might be needed to provide adequate daylight;
    - between 5% and 15% (obstruction angle between 45˚and 65˚), it is very difficult to provide adequate daylight unless very large windows and/or light internal surface finishes are used;
    - less than 5% (obstruction angle greater than 65˚), it is often impossible to achieve reasonable daylight, even if the whole window wall is glazed.

6. *Daylight illuminance*

7. Daylight illuminance method involves using climate data for the location of the site (weather file within the software -EnergyPlus Weather file) to calculate the illuminance from daylight at each point on an assessment grid on the reference plane at an at least hourly interval for a typical year.

8. A target illuminance (E_T) should be achieved across at least half of the reference plane in a daylit space for at least half of the daylight hours.

9. Appendix C, *Interior daylighting recommendations,* of the BRE guide gives guidance on how to calculate the illuminance. This methodology requires 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.

10. The BRE guide 2022 gives the target illuminance recommendations of 200 lux for kitchens, 150 lux for living rooms and 100 lux for bedrooms in UK dwellings. These values are to be exceeded over at least 50% of the assessment points in the room for at least half of the daylight hours.

11. SDA is the daylight metric term and is presented as the percentage of area that achieves the target illuminance (lux) for at least half of daylight hours. The BRE guide also suggests presenting the median illuminance value for each room as this enables comparison with the SDA.

12. Living rooms and kitchens need more daylight than bedrooms. Areas without a special requirement for daylight, like bathrooms, stairwells, garages and storage areas, need not be assessed.

13. Internal and external surfaces and obstructions should be modelled including appropriate surface reflectance. Glazing transmission factors, including maintenance factors, need to be included in the simulation along with account for, or modelling of, window framing.

14. The calculation of illuminance or daylight factor needs to be carried out on a grid of points on a reference plane within each room assessed. The calculation plane should normally be 0.85m from the floor level and is sometimes described as a working plane.

15. It is recommended that a band of 0.3m should be excluded. Professional judgement should be used in cases with irregular-shaped spaces or rooms with corridors or annexe areas. For example, in a room with a corridor, the corridor need not be included in the assessment grid area if it is less than 1.5m).

Glossary of terms

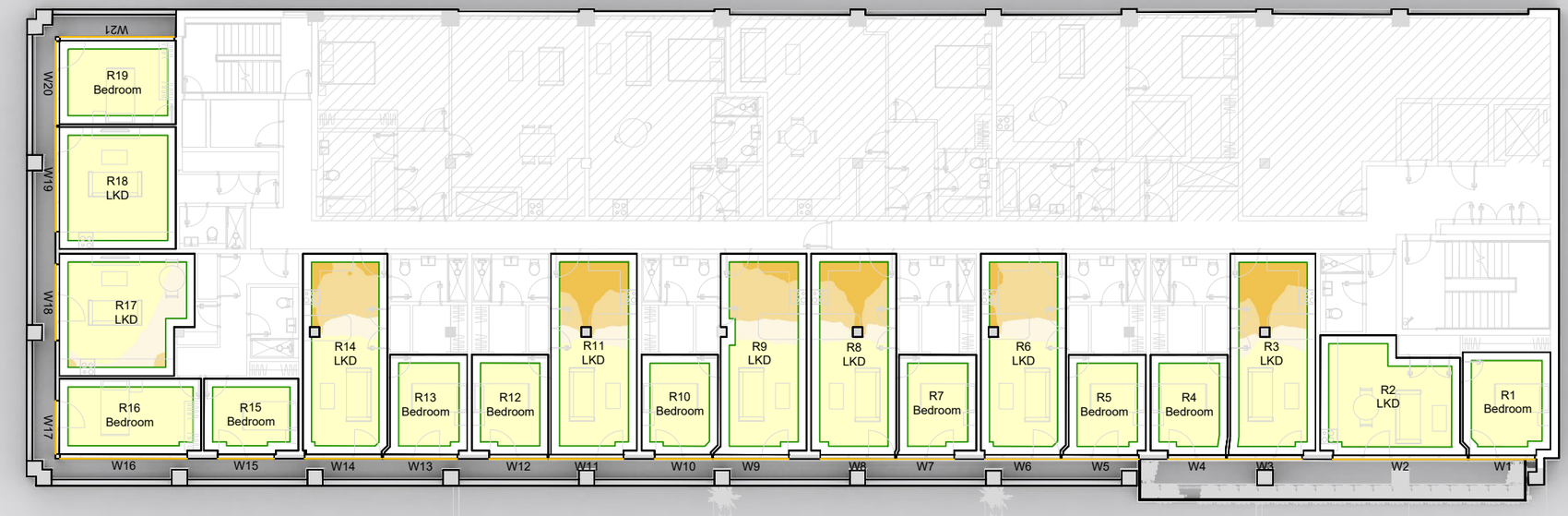
16. The daylight and sunlight terminology used in our report is explained below.

Term	Meaning
Daylight factor(D)	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.
Daylight	Combined skylight and sunlight.
Illuminance	A measure of the amount of light falling on a surface, usually measured in lux.
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.
Sky factor	Ratio of the parts of illuminance at a point on a given plane that would be received directly through unglazed openings from a sky of uniform luminance, to illuminance on a horizontal plane due to an unobstructed hemisphere of this sky. The sky factor does not include reflected light, either from outdoor or indoor surfaces.
Target illuminance (E_T)	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.
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. The ratio is usually expressed as a percentage. The maximum value is almost 40% for a completely unobstructed vertical wall.
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.

Appendix 2

Daylight Illuminance Study

Plan view of 1st floor



Fifth Floor

NO DIMENSIONS TO BE SCALED FROM THIS DRAWING

KEY:
Median illuminance (lux)

- ≥ 200
- ≥ 150
- ≥ 100
- ≥ 50
- < 50

SOURCE DATA:

Existing and surrounding buildings
AccuCities
3D context model
DPR
3D measured survey
2023-05-04-23178-23185-Davigor Road, Hove-MASTER MODEL.dwg

Consented schemes built according to information obtained from local authority website

Proposed Scheme
MCL Architecture
2D drawings received 09.01.2024
Drwg no's:
2228-PH-P-70-01-01-06-P2

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.
MI presents median illuminance (lux) value for each room.

Values of target illuminance for room types in UK dwellings:

Room type	Target Illuminance (lux)
Kitchen/LKD	200
Living room/LD	150
Bedroom	100

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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DRAWING:
DAYLIGHT ILLUMINANCE STUDY
Cumulative Scenario

DRAWN: IM	JOB NBR: 23178
SCALE: 1:200@A3	
DATE: 10.01.2024	
DWG NO: ST-007	REV: -

Appendix 3

Daylight results for proposed habitable rooms

Property & room attributes					Daylight/Sunlight (BRE 2022)		
					Daylight (illum)		
Floor	Flat/Unit no.	Room ref.	Property type	Room use	Target illum (lx)	Median illum (lx)	% area ≥target
Preece House							
F01	U 1.06	R1	Residential	Bedroom	100	456	100%
	U 1.06	R2	Residential	LKD	200	784	100%
	U 1.07	R3	Residential	LKD	200	221	54%
	U 1.07	R4	Residential	Bedroom	100	629	100%
	U 1.08	R5	Residential	Bedroom	100	659	100%
	U 1.08	R6	Residential	LKD	200	251	58%
	U 1.09	R7	Residential	Bedroom	100	612	100%
	U 1.09	R8	Residential	LKD	200	246	56%
	U 1.10	R9	Residential	LKD	200	234	57%
	U 1.10	R10	Residential	Bedroom	100	616	100%
	U 1.11	R11	Residential	LKD	200	239	55%
	U 1.11	R12	Residential	Bedroom	100	681	100%
	U 1.12	R13	Residential	Bedroom	100	658	100%
	U 1.12	R14	Residential	LKD	200	268	59%
	U 1.13	R15	Residential	Bedroom	100	803	100%
	U 1.13	R16	Residential	Bedroom	100	1381	100%
	U 1.13	R17	Residential	LKD	200	249	69%
	U 1.14	R18	Residential	LKD	200	427	100%
	U 1.14	R19	Residential	Bedroom	100	763	100%