264 Belsize Road, London NW6 4BT

Daylight and Sunlight Assessment Report

July 2023

Peter Deer and Associates Ltd
Solar House, 282 Chase Road, Southgate, London N14 6HA
T: 020 3232 0080 • **E:** Maitiniyazi.B@pd-a.co.uk
Registered in England No. 3022343

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Written by:	Checked by:
Jalil Abdullah	John Pengilly

Contact Author

Jalil Abdullah

Solar House, 282 Chase Road, Southgate, London N14 6HA

T: 020 3232 0080 • E: post@pd-a.co.uk

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Executive summary

PDA has been appointed to carry out a daylighting and sunlight assessment of 264 Belsize Road with the BRE 'Site layout planning for daylight and sunlight: a guide to good practice (BR 209:2022 Edition)' requirements, namely Average Daylight Factor (DF) and No-Skyline criteria.

The relationship with neighbouring was considered and the new courtyards inserted at first floor level do not create any visual link with the adjacent properties.

The sunlight assessment results indicates that that the Living room in mezzanine floor has the highest and the ground floor bedrooms have the lowest percentage of sunlight exposure hours due to the surrounding building constraints and the structural shape of the development. In average, whole proposed building has good level of percentage to sunlight exposure.

Following the London Housing Design Guide Section 5.5 and to achieve Daylight credit in Home Quality Mark, the development is designed to achieve DF, and No-Skyline performance criteria described in the 'Site layout planning for daylight and sunlight: a guide to good practice (BR 209:2022)' guidance. A 3-dimensional model of the proposed residence was developed using Integrated Environment Solutions Virtual Environment (IES VE) software [Version 2022.3.0.0].

The calculations have been carried out for all of bedrooms, living rooms and kitchen/dining rooms using FlucsDL and RadianceIES modules of IES VE software. The results are shown as below.

DF results for bedrooms

Level	Room type	Criteria (DF > 0.7)	DF > 0.7	Decision
Ground Floor	Unit 1 Bedroom 1	50%	65%	Pass
	Unit 1 Bedroom 2	50%	77%	Pass
	Unit 2 Bedroom 1	50%	100%	Pass
	Unit 2 Bedroom 2	50%	100%	Pass
	Unit 3 Bedroom 1	50%	100%	Pass
	Unit 3 Bedroom 2	50%	100%	Pass
	Unit 4 Bedroom 1	50%	100%	Pass
	Unit 4 Bedroom 2	50%	100%	Pass
	Unit 4 Bedroom 1	50%	51%	Pass
	Unit 5 Bedroom 2	50%	100%	Pass

DF results for Kitchen/dining rooms

Level	Room type	Criteria (DF > 1.4)	DF > 0.7	Decision
First Floor	Unit 1 Kitchen/Dining Room	50%	97%	Pass
	Unit 2 Kitchen/Dining Room	50%	100%	Pass
	Unit 3 Kitchen/Dining Room	50%	98%	Pass
	Unit 4 Kitchen/Dining Room	50%	100%	Pass
	Unit 5 Kitchen/Dining Room	50%	100%	Pass

DF results for living rooms

Level	Room type	Criteria (DF > 1.1)	DF > 0.7	Decision
Mezzanine Floor	Unit 1 Living Room	50%	100%	Pass
	Unit 2 Living Room	50%	100%	Pass
	Unit 3 Living Room	50%	100%	Pass
	Unit 4 Living Room	50%	100%	Pass
	Unit 5 Living Room	50%	100%	Pass

The assessment shows that all the living rooms/kitchens and bedrooms have satisfactory levels of DF. To provide greater adequate lighting, it is recommended to use of energy efficient lighting to compensate for the reduced levels of lighting in ground floor bedroom. Appendix A and Appendix B show DF results for Whole building and a typical dwelling (Unit 5), respectively.

All the habitable rooms are assessed against the BRE's No-Skyline criteria, and the results are demonstrated in below table.

Level	Room Type	Sky View	Criteria	Decision
Ground Floor	Unit 1 Bedroom 1	0%	80%	Fail
Ground Floor	Unit 1 Bedroom 2	47%	80%	Fail
First Floor	Unit 1 Kitchen/Dining	95%	80%	Pass
Mezzanine Floor	Unit 1 Living Room	100%	80%	Pass
Ground Floor	Unit 2 Bedroom 1	67%	80%	Fail
Ground Floor	Unit 2 Bedroom 2	36%	80%	Fail
First Floor	Unit 2 Kitchen/Dining	96%	80%	Pass
Mezzanine Floor	Unit 2 Living Room	100%	80%	Pass
Ground Floor	Unit 3 Bedroom 1	68%	80%	Fail
Ground Floor	Unit 3 Bedroom 2	100%	80%	Pass
First Floor	Unit 3 Kitchen/Dining	97%	80%	Pass
Mezzanine Floor	Unit 3 Living Room	100%	80%	Pass
Ground Floor	Unit 4 Bedroom 1	77%	80%	Fail
Ground Floor	Unit 4 Bedroom 2	100%	80%	Pass
First Floor	Unit 4 Kitchen/Dining	99%	80%	Pass
Mezzanine Floor	Unit 4 Living Room	100%	80%	Pass
Ground Floor	Unit 5 Bedroom 1	44%	80%	Fail
Ground Floor	Unit 5 Bedroom 2	49%	80%	Fail
First Floor	Unit 5 Kitchen/Dining	98%	80%	Pass
Mezzanine Floor	Unit 5 Living Room	100%	80%	Pass

The assessment shows that all the tested Kitchen/Dining and Living rooms have satisfactory views to the sky and are hence complaint with the BRE's No-Skyline criteria as below. Three bedrooms have no compliance against the BRE's No-Skyline criteria due to the structural shape and surrounding constraints of the site. However, it is not a mandatory requirement for bedrooms to pass against BRE's No-Skyline criteria as per Home Quality Mark One Technical Manual.

1 Introduction

Peter Deer and Associates Ltd (PDA) has been appointed by Control Electrical Engineers Ltd to undertake the design stage daylighting and sunlight assessment for the proposed development of the 5 new dwellings (5 no. two-bedroom duplexes) in response to the pre-application comments.

This report has been prepared by a Chartered Building Sustainability Engineer, Jalil Abdullah (MCIBSE) of PDA, to provide daylight and sunlight assessment for the proposed development to support the full planning application to Camden Borough Council.

The daylight and sunlight assessment were carried out using the methodology outlined in the BRE 'Site layout planning for daylight and sunlight: a guide to good practice (BR 209 2022 Third Edition) requirements.

This document should be read in conjunction with:

- Design and Access Statement
- Energy Statement
- Overheating Assessment Report
- Sustainability Report
- Flood Risk report

1.1 Site location

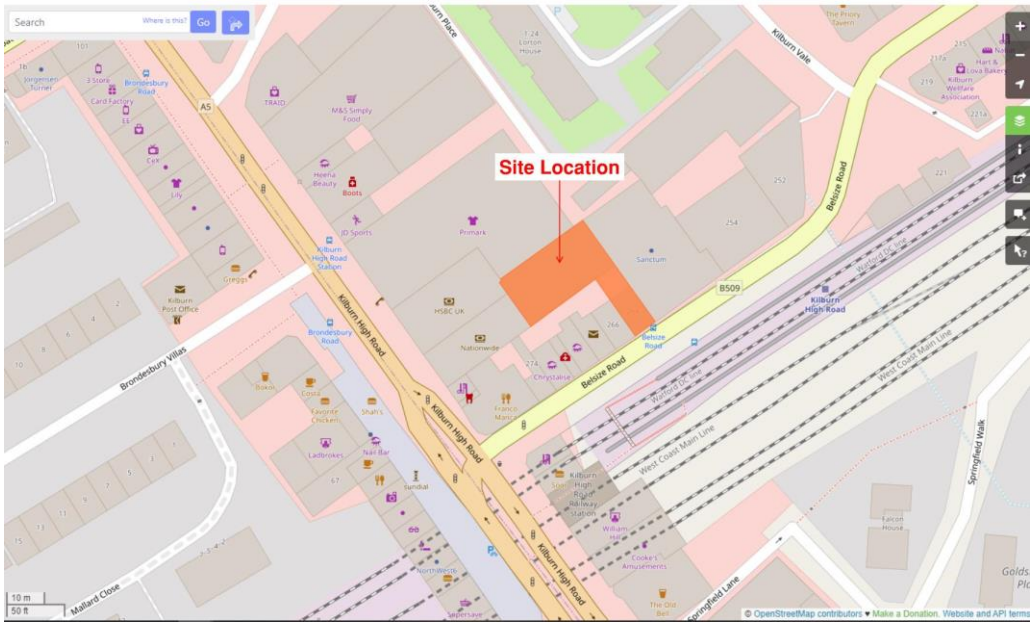


Figure 1-1 Site location (Open Street Map 2022)

Location: 264 Belsize Road, Kilburn, London, NW6 4BT. Proposed dwelling units face southeast.

The site is located in Kilburn within the Borough of Camden. It is located on the northern side of Belsize Road (https://www.openstreetmap.org/#map=19/51.53769/-0.19249). The site area is previously occupied by an existing redundant non-residential institution building.

The site is within an Archaeological Priority Area due to its close proximity to an old Roman road, now the A5. It is approximately 40 metres east of Kilburn High Road. It is adjacent to the Priory Road Conservation Area but is not in the Conservation Area itself.

The top floor living room is located on a mezzanine level which is open to the Kitchen/dining room area below.

The proposed architectural design advances the benefits of stack effect ventilation by using lightwell and openable rooflight features so that the warm air can rise sufficiently from the bedrooms and escape naturally from the roof light, which minimises the overheating risk further.

1.2 Accessibility to natural sunlight

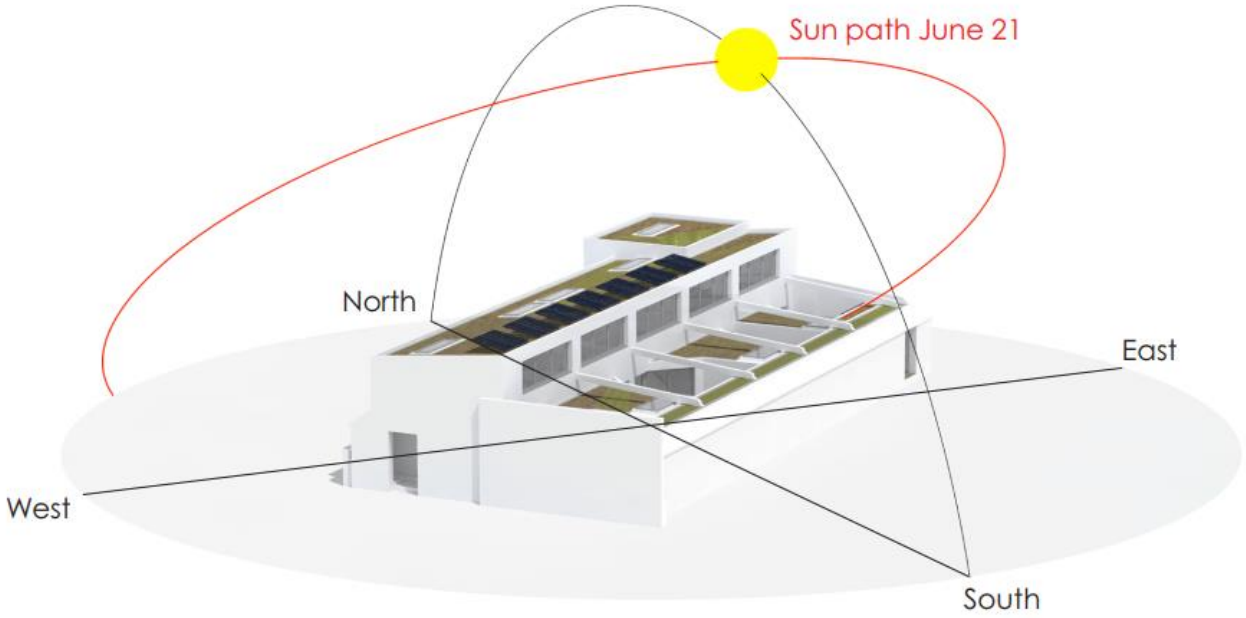


Figure 1-2 3D diagram - Sun tracker

Figure 1-2 shows that this site has good accessibility to the natural sunlight even considering the surrounding constraints. In order to maximise the natural sunlight into the habitable spaces, following design features were included:

- The southern side of the building is opened up at first floor, to create a sequence of individual landscaped courtyards on the south side, between the new accommodation and the access corridor running along the south boundary of the site. New lightwells at ground floor are created within this area, to provide natural light and ventilation to the existing ground floor, to be laid out for the bedrooms.
- The existing high-level glazing along the southern boundary is replaced, to provide natural light into the new corridor. Additional obscure glazing is introduced between the corridor and the new residential patios.
- The inclusion of full-façade height windows improves the daylight penetration in ground floor bedrooms.

Above designs inclusions help the habitable rooms to have the maximum access to the sunlight to create a comfortable environment for the occupants.

2 Planning Policy and Guidance

2.1 National Policy

The National Planning Policy Framework (NPPF) adopted in June 2019, sets out the Government's planning policies and how these are expected to be applied. It provides a framework that can be used by councils to produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.

Section 4 of the NPPF relates to Decision-making setting out the principles to consider when determining applications. Paragraph 38 states that "Local planning authorities should approach decisions on proposed development in a positive and creative way".

Paragraph 123 (c) mentions daylight and sunlight stating that local planning authorities "when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight".

2.2 London Plan

The London Plan is part of the Development Plan. It guides boroughs' development Plans to ensure that they work toward a shared vision for London. It establishes policies that allow everyone involved in new developments to know what is expected.

Policy D6 Housing quality and standards

Housing development should be of high-quality design and provide adequately sized rooms (see Table 3.1) with comfortable and functional layouts which are fit for purpose and meet the needs of Londoners without differentiating between tenures.

Qualitative aspects of a development are key to ensuring successful sustainable housing. Table 3.2 sets out key qualitative aspects which should be addressed in the design of housing developments.

Housing development should maximise the provision of dual aspect dwellings and normally avoid the provision of single aspect dwellings. A single aspect dwelling should only be provided where it is considered a more appropriate design solution to meet the requirements of Part B in Policy D3 Optimising site capacity through the design-led approach than a dual aspect dwelling, and it can be demonstrated that it will have adequate passive ventilation, daylight, and privacy, and avoid overheating.

The design of development should provide sufficient daylight and sunlight to new and surrounding housing that is appropriate for its context, whilst avoiding overheating, minimising overshadowing, and maximising the usability of outside amenity space.

Housing should be designed with adequate and easily accessible storage space that supports the separate collection of dry recyclables (for at least card, paper, mixed plastics, metals, glass) and food waste as well as residual waste.

Housing developments are required to meet the minimum standards below which apply to all tenures and all residential accommodation that is self-contained.

2.2.1 London Plan 2016: Housing Supplementary Planning Guidance – Updated August 2017

The Housing Supplementary Planning Guidance (SPG) provides advice on the implementation of housing policies and the following sections referenced below suggest that a more flexible approach should be taken when considering the daylight and sunlight implications of a proposed development.

Paragraph 1.3.45 Policy 7.6Bd suggests "An appropriate degree of flexibility needs to be applied when using BRE guidelines to assess the daylight impacts of new development on surrounding properties, as well as within new developments themselves."

Paragraph 1.3.46 also suggest that "Decision makers should recognise that fully optimising housing potential on large sites may necessitate standards which depart from these presently experienced but will still achieve satisfactory levels of residential amenity…"

Paragraph 2.3.47 "Quantitative standards on daylight and sunlight should not be applied rigidly, without carefully considering the location and context and standards experienced in broadly comparable housing typologies in London.

Standard 32 in page 87 states that "All homes should provide for direct sunlight to enter at least one habitable room for part of the day. Living areas and kitchen dining spaces should preferably receive direct sunlight."

Paragraph 2.3.45 "In addition to the above standards, BRE good practice guidelines and methodology 146 can be used to assess the levels of daylight and sunlight achieved within new developments, taking into account guidance below and in Section 1.3."

2.3 London Borough of Camden

Paragraph 6.5 in Camden Local Plan 2017 Edition "Loss of daylight and sunlight can be caused if spaces are overshadowed by development. To assess whether acceptable levels of daylight and sunlight are available to habitable, outdoor amenity and open spaces, the Council will take into account the most recent guidance published by the Building Research Establishment (currently the Building Research Establishment's Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice 2011). Further detail can be found within our supplementary planning document Camden Planning Guidance on amenity"

Making the most of daylight

• Maximise the amount daylight entering the building, minimising the need for artificial lighting. • Carefully design windows to maximise the amount of daylight entering rooms to meet the needs of the intended use. • Daylight is dependent on the amount of open, un-obscured sky available outside a window, the amount of sunshine and the amount of light reflected from surrounding surfaces. • The size, angle and shape of openings together with room height depth and decoration determine the distribution of daylight.

Retrieved from Page 6 in Camden Planning Guidance I Energy Efficiency and adaptation (Jan 2021)

Natural light, Daylight/sunlight - All the habitable rooms must have direct natural light, particularly the main living room. The applicant must ensure that the levels of daylight and sunlight that enter habitable rooms comply with BRE standards and that the report for 'Daylight and Sunlight' is submitted with the proposal [London Housing SPG 2016 Standard 32; CPG for Amenity].

Retrieved from Page 123 in Camden Planning Guidance – Housing (Jan 2021)

KEY MESSAGES:

- The Council expects applicants to consider the impact of development schemes on daylight and sunlight levels. Where appropriate a daylight and sunlight assessment should submit which should be follow the guidance in the BRE's Site layout planning for daylight and sunlight: A guide to good practice.
- The 45 degree and 25-degree tests cited in the BRE guidance should be used to assess ('screen') whether a sunlight and daylight report is required.
- Levels of reported daylight and sunlight will be considered flexibly taking into account site-specific circumstances and context.
- • The Council may seek independent verification of sunlight and daylight reports if necessary.

Section 3 in Camden Planning Guidance I Amenity I (Jan 2021)

In order to demonstrate that adequate levels of daylight and sunlight are being provided in accordance with Policy A1, the Council may require applicants to submit daylight and sunlight reports informed by BRE's Site layout planning for daylight and sunlight: A guide to good practice (the 'BRE guidance') or any updated best practice/technical guidance on the assessment of light impacts.

The BRE guidance contains numerous tools, techniques and recommended standards relating to daylight and sunlight that are relevant to both minor and major developments. Officers will use the 45 degree and 25-degree assessment (as set out in the BRE guidelines) to make an initial judgement on the impact of a proposal.

3 Daylighting Guidance and Criteria

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 assessment of daylight and sunlight within proposed buildings. It is important to note that this document is intended to serve as a guide and is not mandatory. Ensuring that the key spaces in a building have sufficient access to daylight has the dual purpose of increasing occupant wellbeing and reducing dependence on electrical lighting, and in turn decreasing the energy demand.

"C2 BS EN 17037 supersedes BS 8206 Part 2 "Code of practice for daylighting" [C2], which contained a method of assessment based on Average Daylight Factor, which is now no longer recommended. For daylight provision in buildings, BS EN 17037 provides two methodologies. One is based on target illuminances from daylight to be achieved over specified fractions of the reference plane (a plane at tabletop height covering the room) for at least half of the daylight hours in a typical year. The other, alternative, method is based on "calculating the daylight factors achieved over specified fractions of the reference plane", this paragraph is retrieved from the BRE handbook.

Therefore, two daylight assessment metrics included in the BRE guide, namely Daylight Factor and No-Skyline are used to evaluate the daylighting levels of the proposed development.

3.1 Sunlight Exposure (SE)

Sunlight Exposure (SE) is a new metric introduced in the BRE 209 (2022). It is the assessment of sunlight in the habitable rooms of a proposed development. All habitable rooms should be tested for SE and levels are given for each room. Under the BRE Guidelines, where one room in a residential unit meets the minimum recommended levels of sunlight exposure, the unit is considered to have passed. However, the BRE Guidelines does state that the room in question should preferably be a living room.

For interiors, access to sunlight can be quantified. BS EN 17037[1] recommends that a space should receive a minimum of 1.5 hours of direct sunlight on a selected date between 1 February and 21 March with cloudless conditions. It is suggested that 21 March (equinox) be used. The medium level of recommendation is three hours and the high level of recommendation four hours. For dwellings, at least one habitable room, preferably a main living room, should meet at least the minimum criterion.

3.2 Daylight Factor

Daylight Factor (DF) refers to the ratio of total daylight flux incident on the working plane to the area of the working plane, expressed as a percentage of the outdoor illuminance on a horizontal plane due to an unobstructed CIE standard overcast sky.

DF is a 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. Thus a 1% DF would mean that the indoor illuminance at that point in the space would be one hundredth the outdoor unobstructed horizontal illuminance.

The daylight factor and daylight illuminance also depend on the room and window dimensions, the reflectance of interior surfaces and the type of glass, as well as the obstructions outside. These are appropriate measures to use in new buildings because most of these factors are within the developer's control.

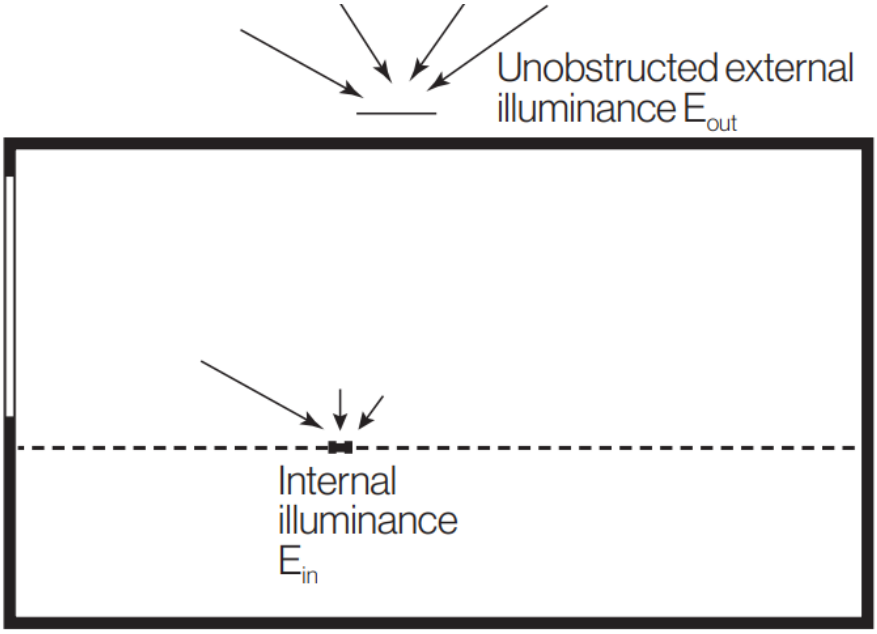


Figure 3-1 Definition of daylight factor D. Under standard overcast conditions: D = Ein/Eout x 100%

The BRE guidance states that the daylight factor targets to be achieved are at least 50% of the assessment grid in domestic habitable rooms with vertical and/or inclined daylight apertures. In the case of 264 Belsize Road development, there are combined dining rooms and kitchens so these rooms will have to meet the requirement of 1.4 % to pass.

The Average Daylight Factor requirements for different areas are summarised in Table 3-1.

Table 3-1 - BRE Daylighting Guidance

Area	over at least 50% of the assessment grid	over at least 95% of the assessment grid
Bedrooms	0.7%	N/A
Kitchen/dining	1.1%	N/A
Living Room	1.4%	N/A

DA is the amount of time a space can expect to reach a target illuminance level on the working plane. This criterion is aimed at delivering an energy efficient space. A minimum DA of 50% for each occupied space should be targeted.

3.3 No-Skyline

This method of assessment considers the total glazed area to the room, the transmittance quality of the glazing proposed, the total area of the room surfaces including ceilings and floors, and the internal average reflectance for the room being assessed. The method also considers the Vertical Sky Component.

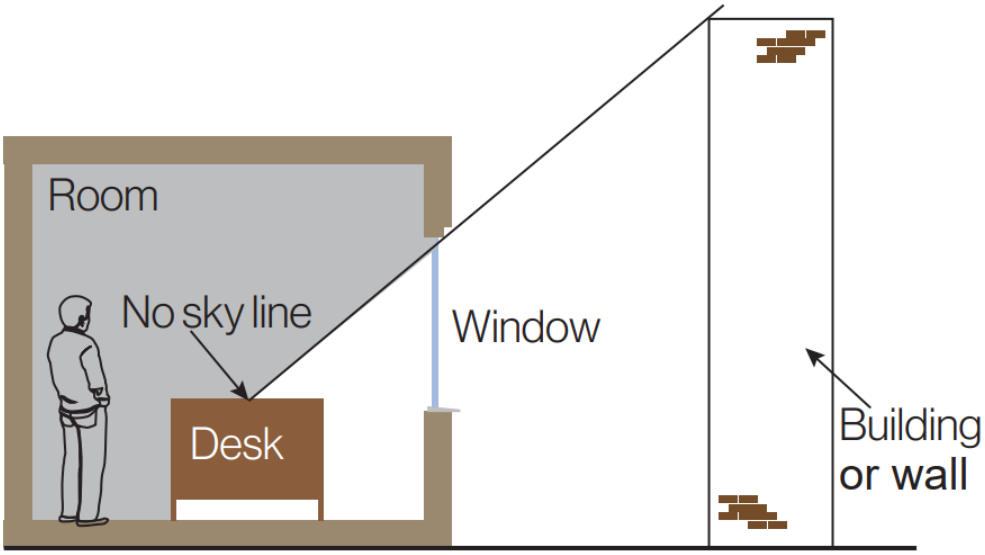


Figure 3-2 The no skyline divides areas of the working plane which can and cannot receive direct skylight

Figure 3-2 demonstrates that the no skyline divides points on the working plane which can and cannot see the sky (In houses the working plane is assumed to be horizontal and 0.85 m high). Areas beyond the no skyline, since they receive no direct daylight usually look dark and gloomy compared with the rest of the room, however bright it is outside. Supplementary electric lighting will be needed if a significant part of the working plane (20% of the room or more) lies beyond the no skyline.

According to criteria 3 in Section 4.2 of Home Quality Mark One Technical Manual, 80% of the working plane in each kitchen, living room, dining room and study receives direct light from the sky. Nonetheless, it is not required for bedrooms to pass the skyline criteria as they have met the daylight factor standard.

4 Methodology

A 3-dimensional model of the proposed residence was developed using Integrated Environment Solutions Virtual Environment (IES VE) software [Version 2022.3.0.0]. The daylight and sunlight assessment were carried out using sunCast, FlucsDL and RadianceIES modules, both of which utilise the radiance engine to produce daylighting assessment results following the 'Site layout planning for daylight and sunlight: a guide to good practice (BR 209:2022)'. The inputs and assumptions used in the model are covered in the following sections.

It must be noted that dynamic building simulation provides an estimate of building performance. This estimate is based on a necessarily simplified and idealised version of the building that does not and cannot fully represent all the intricacies of the building once built. As a result, simulation results only represent an interpretation of the potential performance of the building. No guarantee or warrantee of building performance in practice can be based on simulation results alone.

Also, the relationship of the proposed development with neighbouring buildings along Belsize Road were also addressed in the design as mentions in the section below.

4.1 Model Geometry

An axonometric view of the IES VE model of the apartment block is provided in Figure 3-1. The geometry and shading are based on the architectural site plans, any detail regarding local shading and the surrounding area not captured by the site plans have not been included.

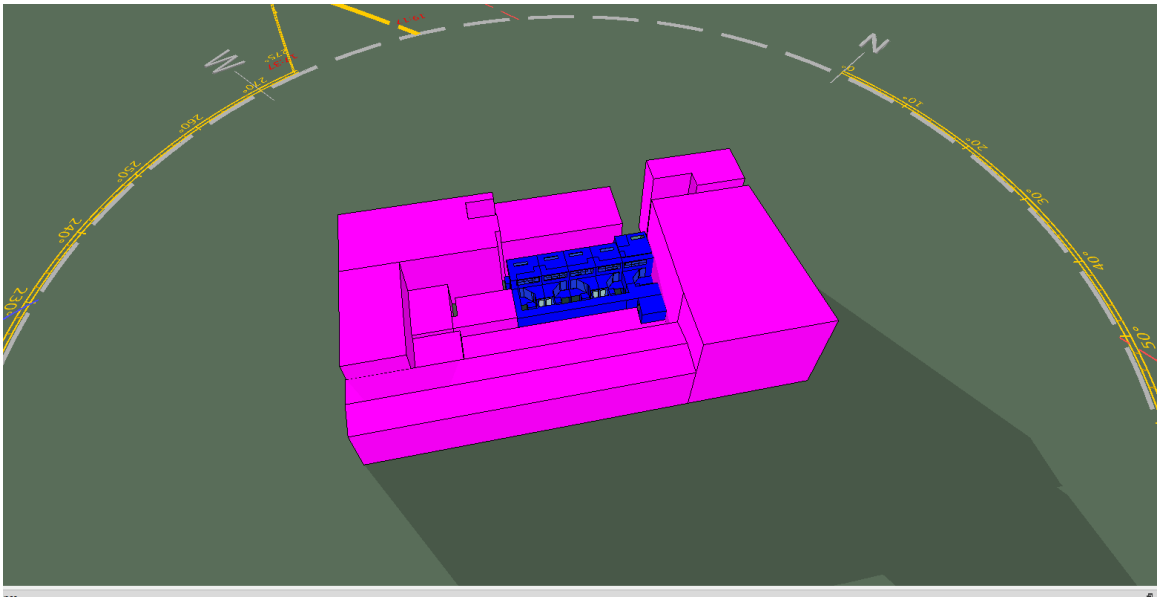


Figure 4-1 - 3-D model of 264 Belsize on IES

4.2 Weather Data

The weather file used in this analysis is the London Heathrow Airport (LHR) Design Summer Year 1 (DSY1) for the 2020s, high emissions, 50% percentile scenario. This weather file was used to represent the site's type of terrain. The site in northwest London has an urban topography, like that of London Heathrow.

4.3 Reflectance Factors and Glazing Diffuse Transmittance

The assumed reflectance and transmittance factors used for the internal finishes of the constructions are provided in Table 4-1. These are values are adjusted from the values recommended in BS EN 17037:2018, which is the latest British standard covering daylighting in buildings. This adjustment was made as it is proposed in the design to use higher reflectance materials/colours for the floors, walls and ceilings.

Table 4-1 – Assumed construction parameters

Component	Default Reflectance Factor	Transmittance Factor
External walls	0.95	-
Internal wall	0.95	-
Ceiling	0.95	-
Floors	0.7	-
Vertical Glazing	-	0.7 (Frame factor: 20%)

4.4 AOI Shrinkage

According to the BRE Document C28, the calculation of illuminance or daylight factor (as described in the methodologies above) needs 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 standard recommended that a band of 0.3m should be excluded, to avoid excluding parts of the room that are used by the occupants in dwellings to create an area of interest (AOI).

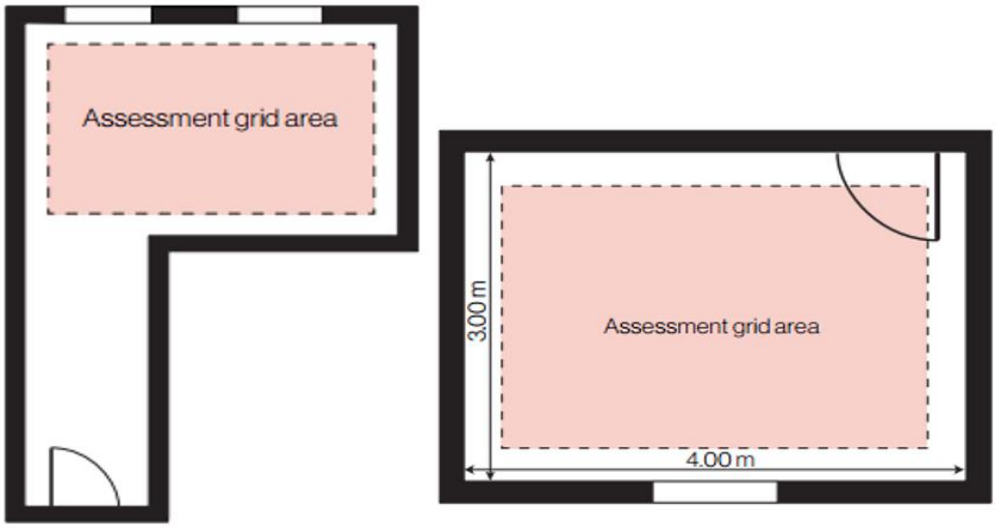


Figure 3-2 - Example assessment grid areas for different room layouts

All the habitable rooms including bedrooms, kitchen/dining, and Living rooms are analysed for daylight factor and no sky-view assessment. The layout is refence to architectural drawings shown in Appendix C.

5 Results and Analysis

5.1 Relationship with relationship with neighbouring buildings

The form of the new adapted improves the outlook from the rear of the properties along Belsize Road by reducing the overall mass of them building on the south side of the site. Because the profile of the south boundary wall is left intact, the new courtyards inserted at first floor level do not create any visual link with the adjacent properties.

It should be noted that the edges of the mezzanines are set back from the high-level external windows adjacent. Consequently, the distance between the new mezzanines on the north side of the site and the rear elevations to 268-270 Belsize Road is similar to the current relationship between the south elevation of 50-52 Kilburn High Road and these properties. approximately 15.150 m (Figure 5-1).

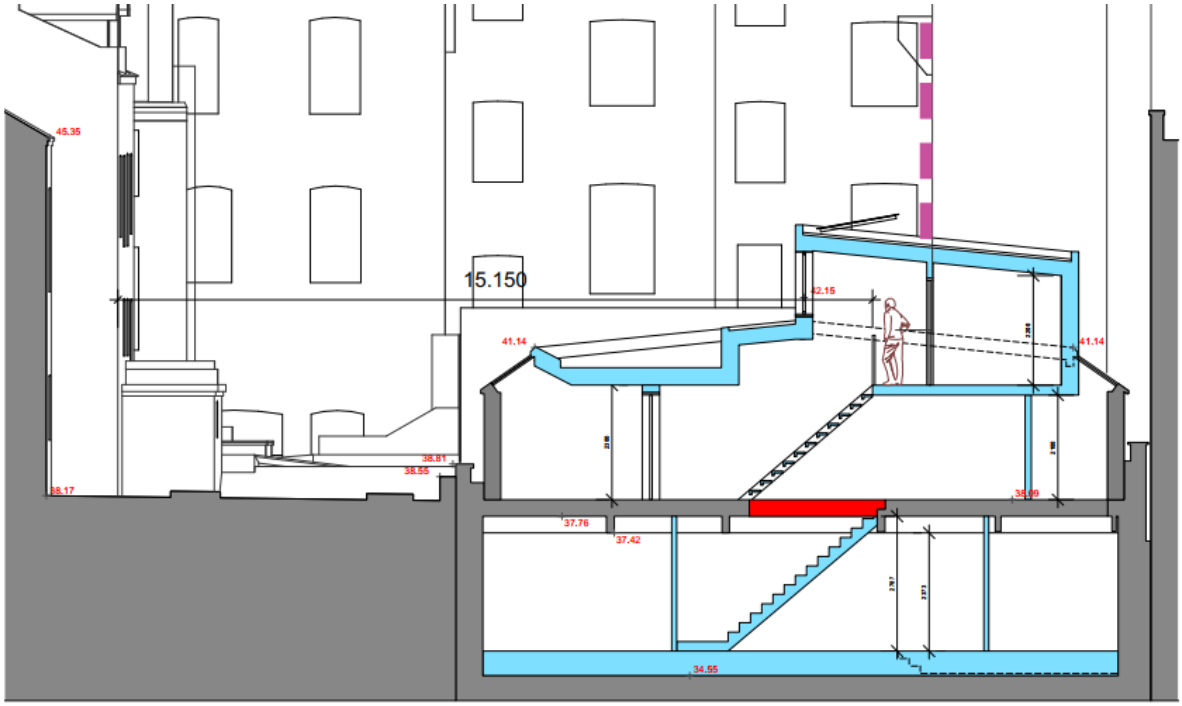


Figure 5-1 Section view to demonstrate the relationship with neighbouring buildings

Figure 5-1 indicates that the proposed development has minimal effect in the access to sunlight/daylight of neighbouring building.

5.2 Sunlight Exposure

The dynamic Suncast simulation is carried out for the proposed development to assess the percentage of sunlight exposure hours using IES VE Suncast module and the results are shown in Figure 5-2.

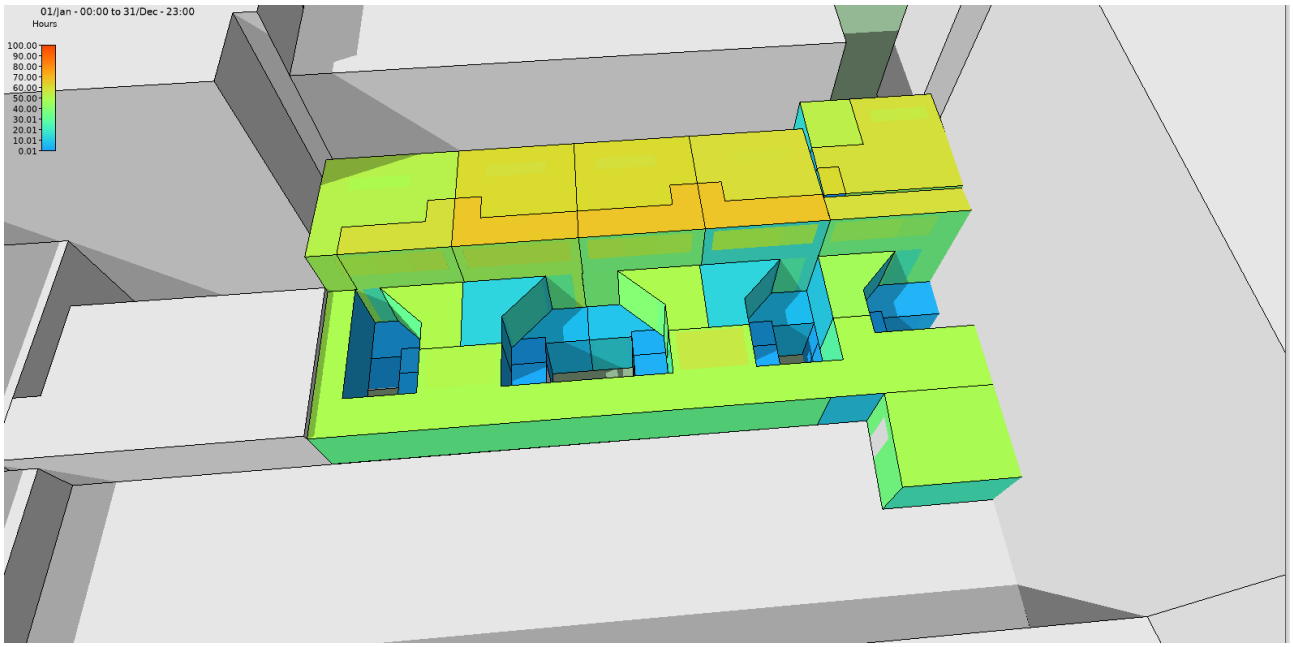


Figure 5-2 Percentage of sunlight exposure hours

Figure 5-2 indicates that the living room in mezzanine floor has the highest access to sunlight, followed by kitchen/dining room in first floor and the ground floor bedrooms has the lowest percentage of sunlight exposure hours due to the surrounding building constraints and the structural shape of the development. On average, whole proposed building has good level of percentage to sunlight exposure.

5.3 Daylight Factor

The calculated average daylight factors for the bedrooms, kitchen/dining spaces and living rooms are presented in Table 5-1, Table 5-2, and Table 5-3.

Table 5-1 - DF results for bedrooms

Level	Room type	Criteria (DF > 0.7)	DF > 0.7	Decision
Ground floor	Unit 1 Bedroom 1	50%	65%	Pass
	Unit 1 Bedroom 2	50%	77%	Pass
	Unit 2 Bedroom 1	50%	100%	Pass
	Unit 2 Bedroom 2	50%	100%	Pass
	Unit 3 Bedroom 1	50%	100%	Pass
	Unit 3 Bedroom 2	50%	100%	Pass
	Unit 4 Bedroom 1	50%	100%	Pass
	Unit 4 Bedroom 2	50%	100%	Pass
	Unit 4 Bedroom 1	50%	51%	Pass
	Unit 5 Bedroom 2	50%	%	Pass

Table 5-2 - DF results for Kitchen/dining rooms

Level	Room type	Criteria (DF > 1.4)	DF > 0.7	Decision
First Floor	Unit 1 Kitchen/Dining Room	50%	97%	Pass
	Unit 2 Kitchen/Dining Room	50%	100%	Pass
	Unit 3 Kitchen/Dining Room	50%	98%	Pass
	Unit 4 Kitchen/Dining Room	50%	100%	Pass
	Unit 5 Kitchen/Dining Room	50%	100%	Pass

Table 5-3 - DF results for living rooms

Level	Room type	Criteria (DF > 1.4)	DF > 0.7	Decision
Mezzanine Floor	Unit 1 Living Room	50%	100%	Pass
	Unit 2 Living Room	50%	100%	Pass
	Unit 3 Living Room	50%	100%	Pass
	Unit 4 Living Room	50%	100%	Pass
	Unit 5 Living Room	50%	100%	Pass

The assessment shows that all the living rooms/kitchens and bedrooms have satisfactory levels of DF. It should be noted that since the layout of the apartments are open plan, a clear distinction has not been made between the dining and kitchen areas. The DF of the combined kitchen/living areas exceeds the guidance of 1.4% DF for kitchens. Therefore, it can be concluded that all the habitable rooms have satisfactory levels of daylight. The whole building DF and Typical (Unit 5) DF results in contour are shown in Appendix A and Appendix B.

5.4 No-Skyline / Sky View

The calculated sky view factors for the bedrooms, kitchen/dining, and living spaces, are presented in Table 4-5,

Table 5-5, and Table 5-6. The assessment shows that all the tested apartment rooms have satisfactory views to the sky and are hence compliant with the BRE's No-Skyline criteria. The sky view is represented as a percentage of the floor area that has access to a clear view of the sky.

Table 5-4 - Sky view results for bedrooms

Level	Room type	Criteria	Average	Decision
Ground Floor	Unit 1 Bedroom 1	80%	0%	Fail
	Unit 1 Bedroom 2	80%	47%	Fail
	Unit 2 Bedroom 1	80%	72%	Fail
	Unit 2 Bedroom 2	80%	36%	Fail
	Unit 3 Bedroom 1	80%	64%	Fail
	Unit 3 Bedroom 2	80%	100%	Pass
	Unit 4 Bedroom 1	80%	73%	Fail
	Unit 4 Bedroom 2	80%	100%	Pass
	Unit 4 Bedroom 1	80%	49%	Fail
	Unit 5 Bedroom 2	80%	51%	Fail

Table 5-5 - DF results for Kitchen/dining rooms

Level	Room type	Criteria	Average	Decision
First Floor	Unit 1 Kitchen/Dining Room	80%	95%	Pass
	Unit 2 Kitchen/Dining Room	80%	96%	Pass
	Unit 3 Kitchen/Dining Room	80%	97%	Pass
	Unit 4 Kitchen/Dining Room	80%	99%	Pass
	Unit 5 Kitchen/Dining Room	80%	98%	Pass

Table 5-6 - DF results for living rooms

Level	Room type	Criteria	Average	Decision
Mezzanine Floor	Unit 1 Living Room	80%	100%	Pass
	Unit 2 Living Room	80%	100%	Pass
	Unit 3 Living Room	80%	100%	Pass
	Unit 4 Living Room	80%	100%	Pass
	Unit 5 Living Room	80%	100%	Pass

The assessment shows that all the tested kitchen/dining, and living room have satisfactory views to the sky and are hence complaint with the BRE's No-Skyline criteria. However, some bedrooms have no compliance against the BRE's No-Skyline criteria due to the constraint surroundings and structural shape of the development. It is not a mandatory requirement for bedrooms to pass the skyline criteria as it has already met the average daylight factor standard.

6 Summary and Conclusions

A daylighting assessment has been carried out to analyse the amount and quality of daylight available to the applicable zones within the proposed 264 Belsize Road development.

Following the London Housing Design Guide Section 5.5 and to achieve Daylight credit in Home Quality Mark, the development is designed to achieve DF, and No-Skyline performance criteria described in the BRE 209 guidance. The calculations have been carried out using FlucsDL and RadianceIES modules of the Integrated Environment Solutions (IES) software.

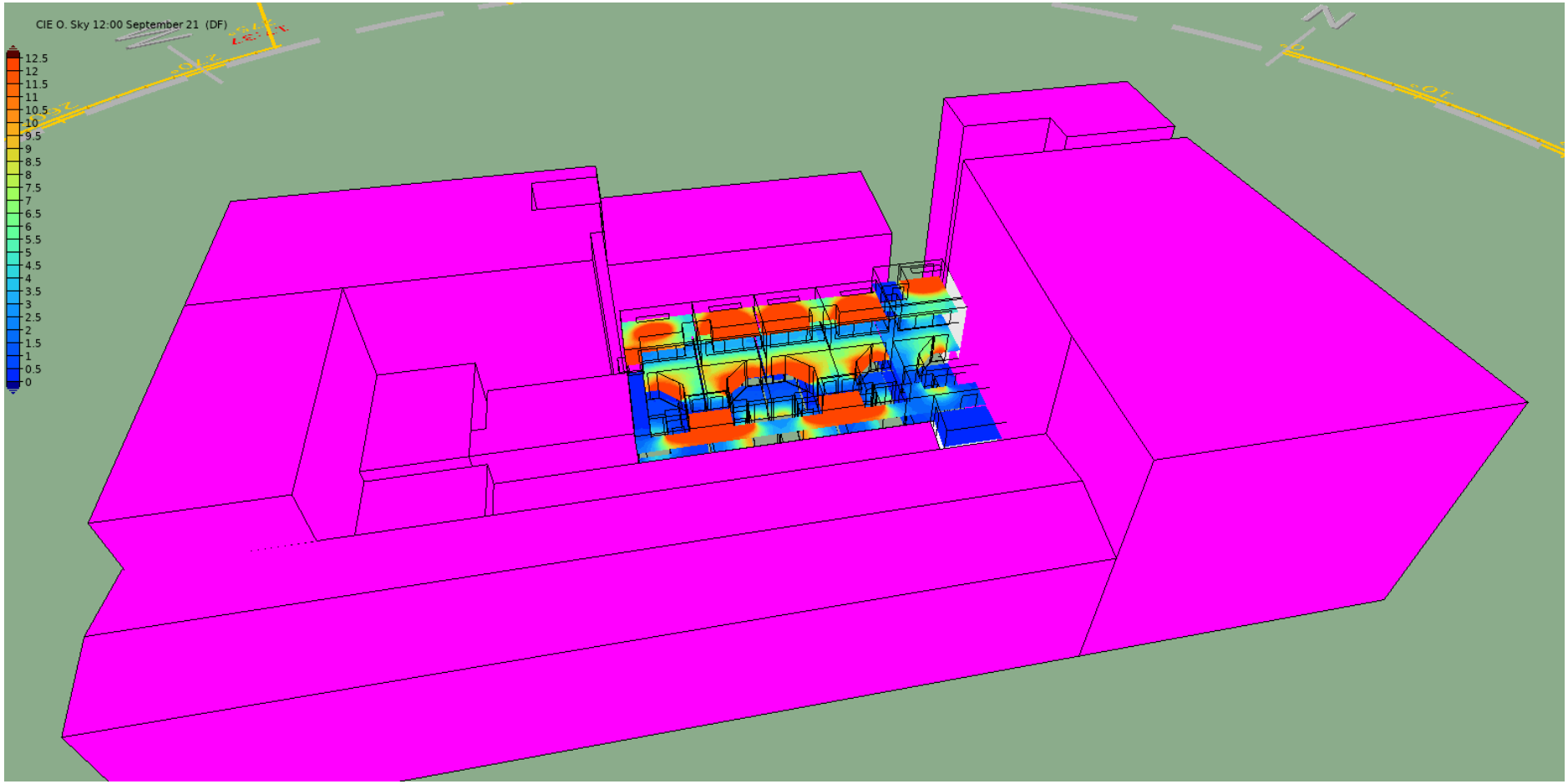
The relationship with neighbouring was included and it states that buildings the new courtyards inserted at first floor level do not create any visual link with the adjacent properties.

The dynamic SunCast simulation is carried out for the proposed development to assess the percentage of sunlight exposure hours using IES VE SunCast module. The results indicates that that the living room in mezzanine floor has the highest and the ground floor bedrooms has the lowest percentage of sunlight exposure hours due to the surrounding building constraints and the structural shape of the development. In average, whole proposed building has good level of percentage to sunlight exposure.

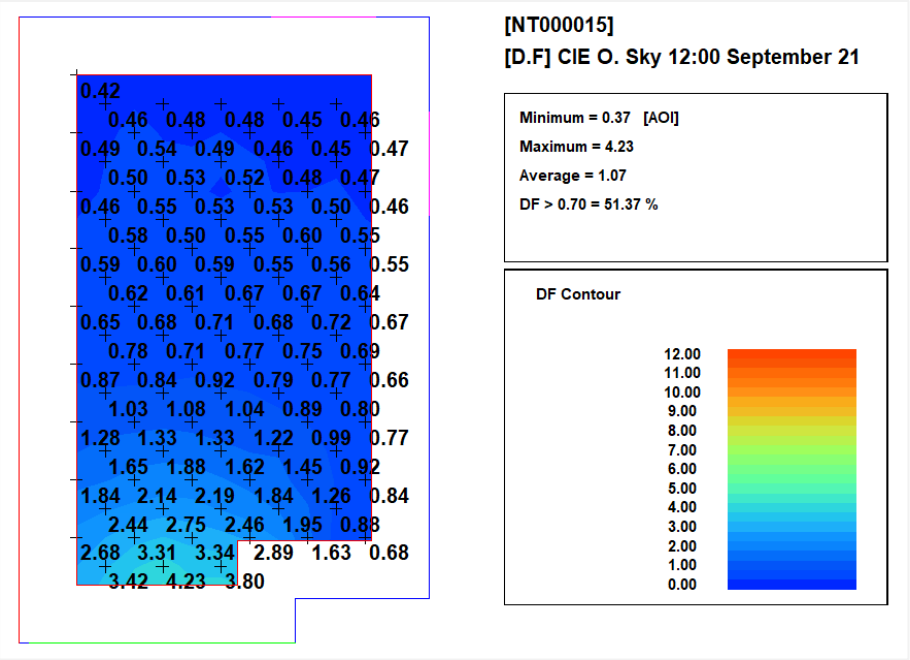
The daylight modelling has been carried out for bedrooms, living rooms, and kitchen/dining rooms and the evaluation shows that all the living rooms/kitchens and bedrooms have satisfactory levels of DF. However, to provide adequate lighting it is recommended that energy efficient lighting should be used to compensate for the reduced levels of lighting in ground floor bedrooms.

The evaluation further indicates that the kitchen/dining and living rooms that were examined all have acceptable sky views and meet the BRE's No-Skyline standards. However, some bedrooms do not meet these standards due to the limitations of the surrounding area. Nonetheless, it is not required for bedrooms to pass the skyline criteria as they have met the daylight factor standard.

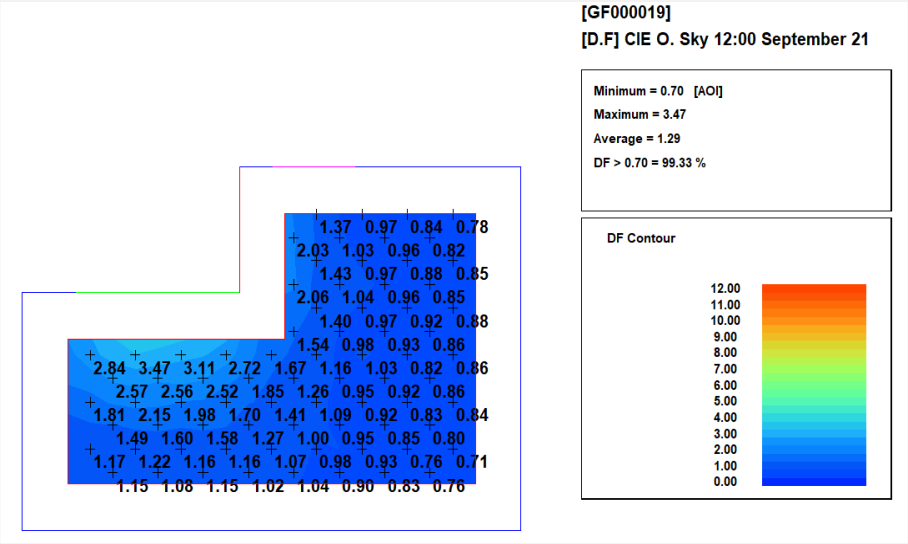
Appendix A Overall indicative results



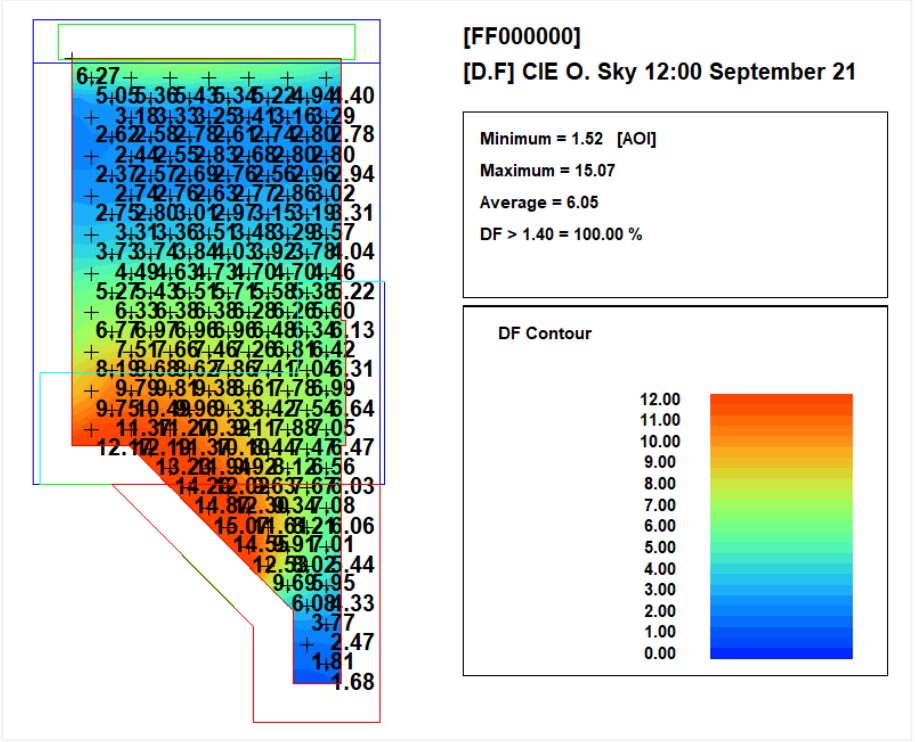
Appendix B DF results for typical dwelling (Unit 5)



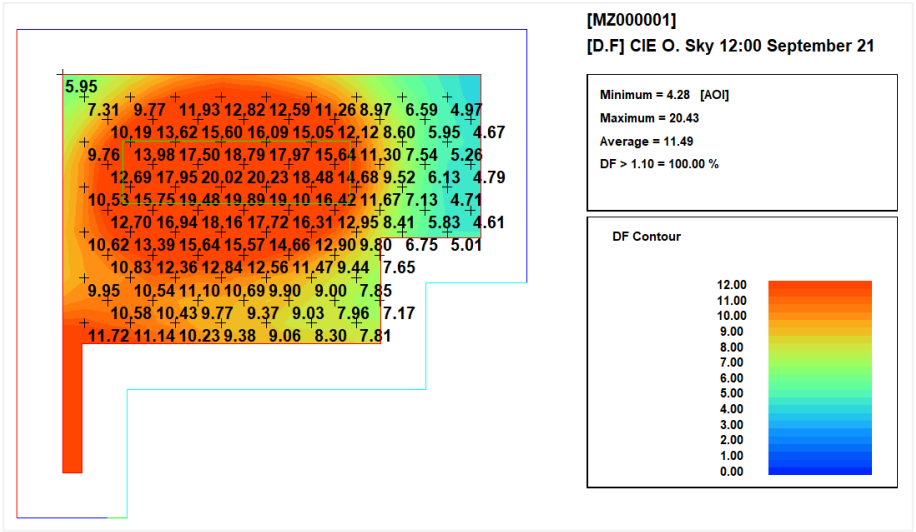
Bedroom 1



Bedroom 2

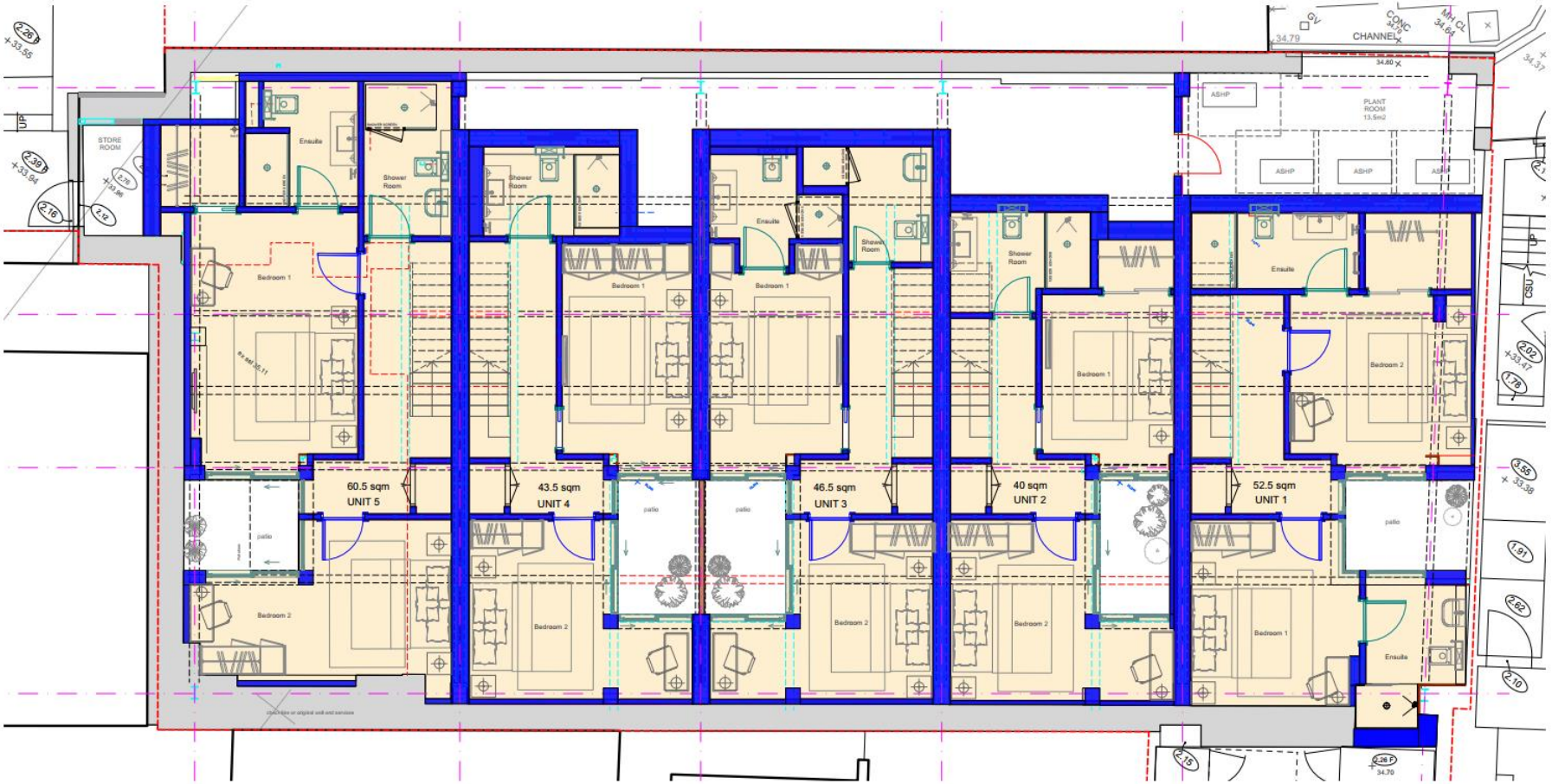


Kitchen/dining room



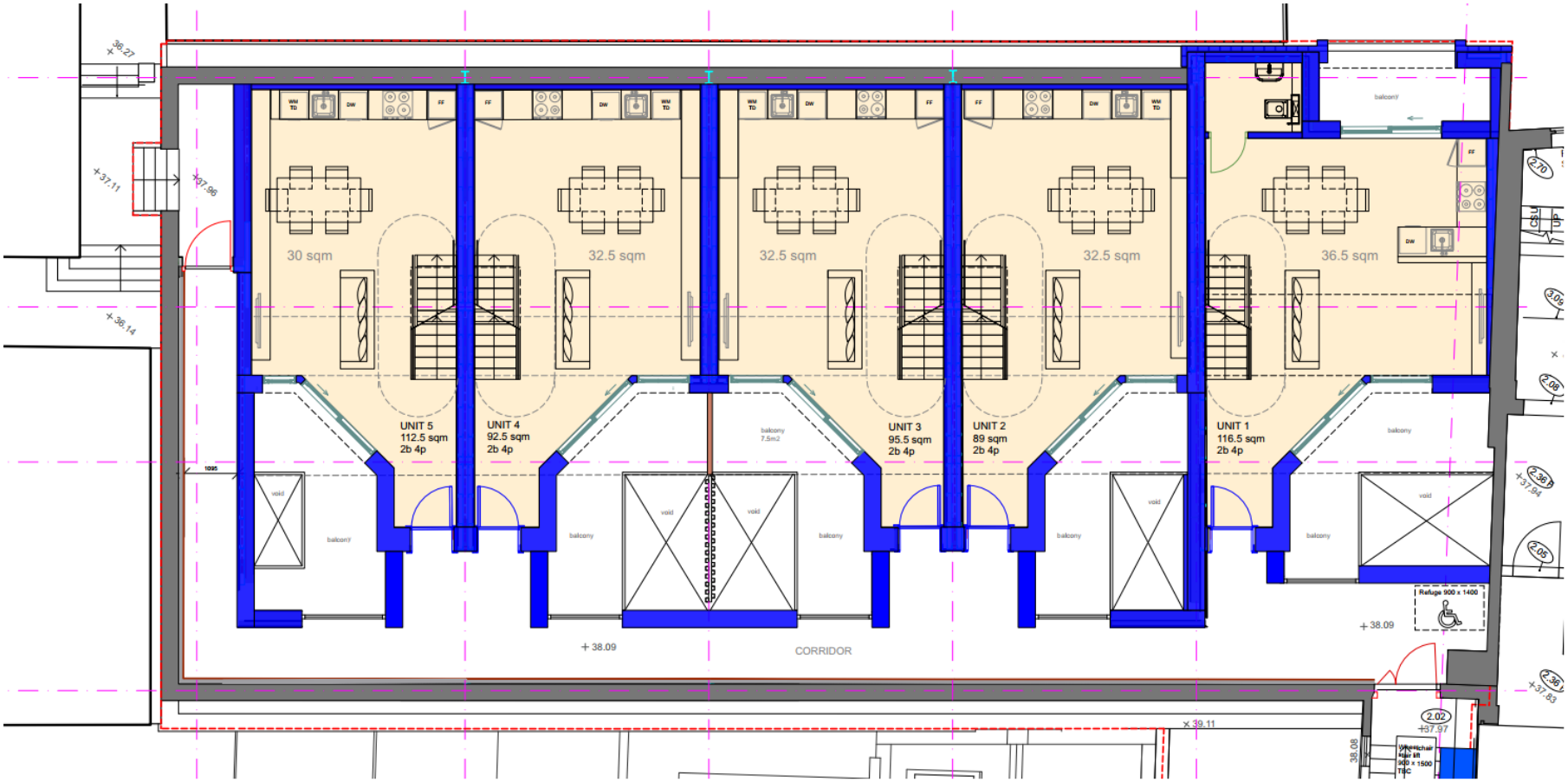
Living room

Appendix C Assessed Dwelling Layouts



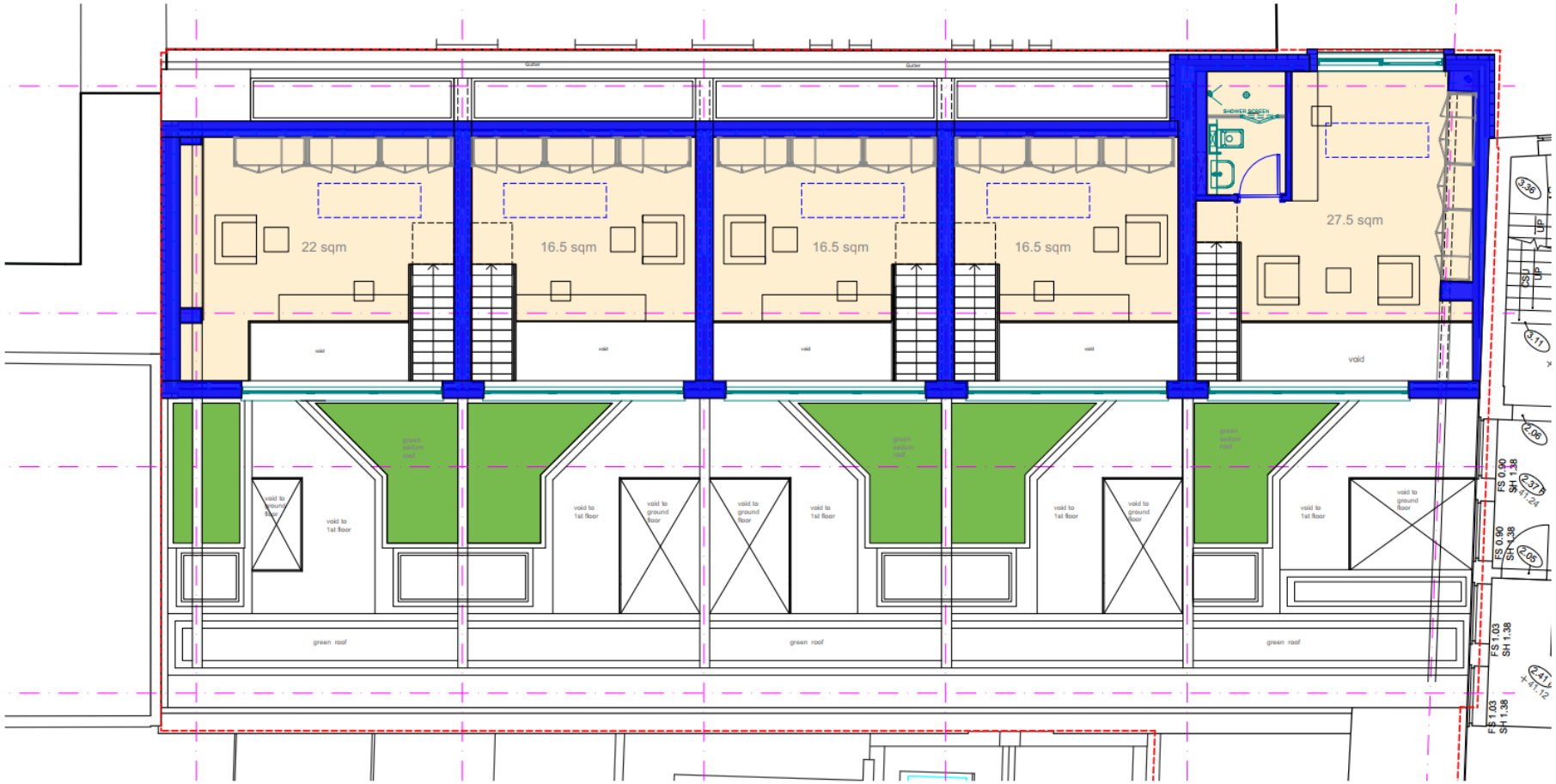
GROUND FLOOR LEVEL

Bedrooms in Ground Floor



FIRST FLOOR LEVEL

Kitchen/dining rooms in First Floor



MEZZANINE FLOOR LEVEL

Living rooms in Mezzanine floor