NRG CONSULTING

INTERNAL DAYLIGHT CALCULATIONS

ROYAL COLLEGE STREET

SEPTEMBER 2020

Document Control Sheet

Report Ref.	D1613/RCS/DL/202002-AV
Rev.	B
Issue Purpose	For Planning Issue
Client	Frontline Architects
Site Address	313, Royal College Street, London, NW1 9QS
Assessor	Alex Visintini
Approved By	Ryan Thrower
Date of Issue	14.09.2020

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CONTENTS

1. EXECUTIVE SUMMARY

1.1 NRG Consulting have been appointed by Frontline Architects to carry out Internal Daylight Calculations to determine the internal daylight levels for one unit at a proposed change of use development at 313, Royal College Street, London NW1 9QS.

1.2 The following guidelines have been followed to assess the proposed development:

- *BS 8206-2:2008 Lighting for Buildings – Part 2: Code of practice for daylighting*.

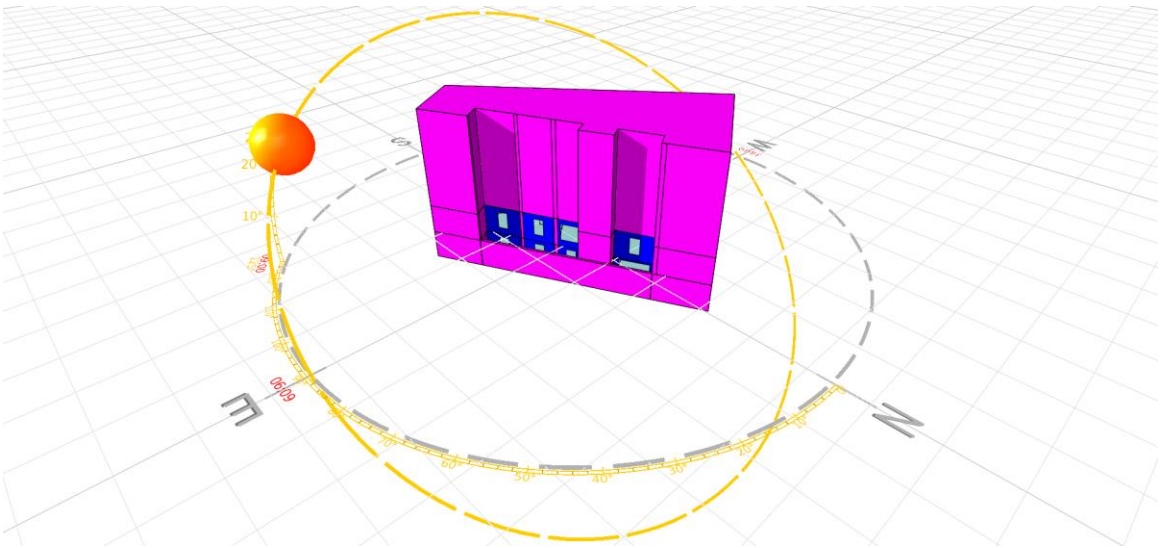

Figure 1: *3d Model of Proposed Buildings.*

2. INTRODUCTION

2.1 Background

The BSI has set out in BS 8206-2:2008 “Lighting for Buildings – Part 2: Code of practice for daylighting” guidance to good practice in daylighting design, and presents criteria intended to enhance the well-being and satisfaction of people in buildings.

This study assesses the availability of Daylight and Sunlight to the façades of the local dwellings with respect to the design proposals prepared by the design team.

NRG Consulting has proposed the following methodology to assess the layouts proposed:

- Carry out daylight assessment using the methodologies set out in by BRE and British Standard Guidelines for diffuse daylight and sunlight conditions.

- Prepare a 3D computer model to assess the internal Average Daylight Factor (ADF) for the living rooms, kitchens and bedrooms of the proposed development and assess the daylight levels for different windows dimensions.

2.2 The Nature and Effect of Daylight and Sunlight

The provision of daylight is as important as ensuring low levels of noise, or low levels of odour, in maintaining the enjoyment of one’s property. Adequate levels of daylight are important not only to light and heat the home, but also for an occupant’s emotional well-being. Daylight is widely accepted to have a positive psychological effect on human beings and there is a great deal of evidence to suggest that people who are deprived of daylight are more susceptible to depression and mood swings. This is common in northern countries, such as Norway, Iceland and Canada where daylight is scarce during the winter months.

3. DAYLIGHT AND SUNLIGHT ASSESSMENT GUIDANCE

3.1 Assessment of the Effect of Daylight and Sunlight

When assessing the effects of proposed building projects on the potential to cause issues relating to light, it is important to recognize the distinction between daylight and sunlight. Daylight is the combination of all direct and indirect sunlight during the daytime, whereas sunlight comprises only the direct elements of sunlight. On a cloudy or overcast day, diffused daylight still shines through windows, even when sunlight is absent.

Care should also be taken when the development is situated to the south of existing buildings, as in the northern hemisphere, the majority of the sunlight comes from the south. In the UK (and other northern hemisphere countries) south-facing facades will, in general, receive most sunlight, while north-facing facades will receive fewer sunlight hours during summer months, specifically early mornings and late evenings.

The Building Research Establishment (BRE) report, BRE 209 "Site Layout Planning for daylight and sunlight- a guide to good practice" by P J Littlefair, looks at three separate areas when considering the impacts of a new development on an existing property:

- Daylight - The impacts of all direct and indirect sunlight during daytime.
- Sunlight - The impacts of only the direct sunlight; and overshadowing of garden and open spaces.
- Overshadowing of Gardens and Open spaces.

A spacing to height ratio of just over 2:1 is normally enough to allow adequate daylighting on building faces. This aspect has not been analysed in this report as the proposed development is more than 18 metres from all neighbouring dwellings.

Appendix 1 in the BRE Report details the methodologies and criteria.

The BRE report provides guidelines for when the obstruction to sunlight may become an issue:

- If the proposed or existing development has a window that faces within 90° of due south, and
- On this window wall, all points on a line 2m above ground level are within 4m (measured sideways) of a point which receives at least a quarter of annual probable sunlight hours, including at least 5% of annual probable sunlight hours during the winter months, between 21st September and 21st March.

BSI guidance BS 8206-2:2008 "Lighting for Buildings – Part 2: Code of practice for daylighting" provides criteria for ADF in various internal spaces.

Table 1 below summarises the criteria used in this report to assess the internal ADF.

PARAMETER	REPORT REFERENCE	ACCEPTABILITY CRITERIA	
ADF	BS 8206-2:2008 Section 5.6	Bedrooms	Minimum ADF 1%
		Living Rooms	Minimum ADF 1.5%
		Kitchens	Minimum ADF 2%

Table 1: *BRE Daylighting Criteria*

4. METHODOLOGY APPLIED

4.1 Data

All the information has been taken directly from digital files provided by the Design Team. The proposed internal layout of Unit 1, its floor height and the windows dimensions has been taken from the provided floor plans and section drawings.

Figure 2: *Aerial View of the site as existing*

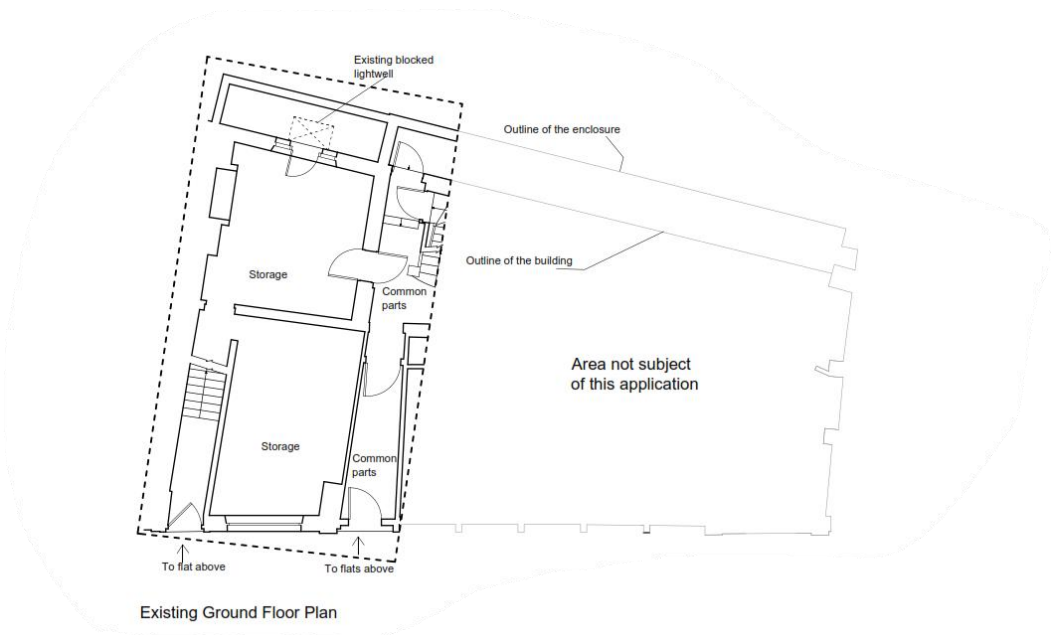

Figure 3: *Site Plan as existing*

4.2 3D Model

To complete the daylight and sunlight assessment, a full-size 3D model of the proposed development was constructed in IES ModelIT. The Average Daylight Factor has been assessed with IES Radiance, a thermal and environmental analysis program.

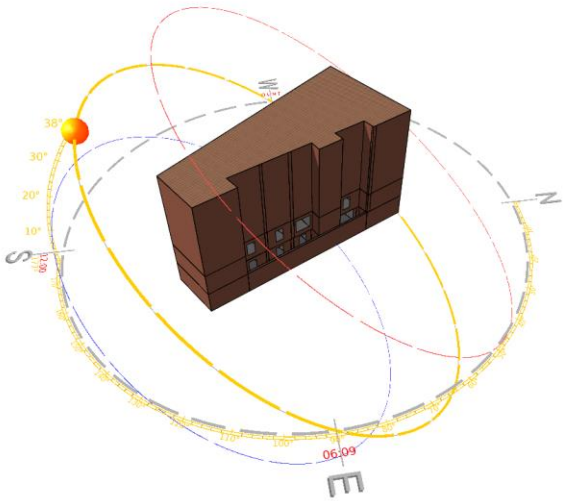

Figure 5: *IES 3D model of the proposed development.*

4.3 Internal Surface Properties

The reflectance for room internal surfaces poses an effect on Average Daylight Factor result, whereby lighter colours result in higher reflectance (white: 1.0; black:0.0). Table 2 below includes the internal surface properties used in this assessment.

Surface	Reflectance	
Floor	0.58	
Walls	0.71	
Ceiling	0.90	
Window	Light Transmittance	0.71

Table 2: *Internal surface properties*

4.4 Design Data

Architects: Frontline Architects, 45, St. Mary's Road, London, W5 5RG
Drawing pack issued for Assessment on 26.02.2020

Sections_.pdf	26/02/2020 09:19	PDF Document	305 KB
Rear Ely.pdf	26/02/2020 09:19	PDF Document	305 KB
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5. METHODOLOGY APPLIED

5.1 Average Daylight Factor – Proposed Development

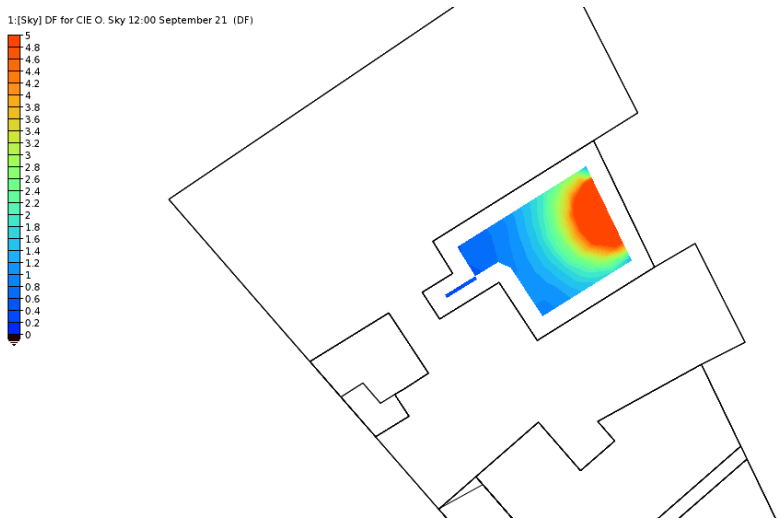
We have assessed the proposed new accommodation at 313, Royal College Street, London, to determine whether the internal spaces will be provided with adequate daylight by reference to Average Daylight Factor (ADF). The average daylight factor is a measurement of the VSC at the window face combined with the average reflectances of the surfaces inside the room, the area of the glazing and size of the room. This gives a more detailed assessment for the light that will be available in the space than the more simplistic measure of VSC which gives details of the potential for reasonable daylighting within the space rather than an actual measure of the internal effects. BS 8206 Pt2, which is incorporated into the BRE Guide, recommends that interiors intended to have supplementary electric lighting – in other words, normal building interiors – should have an ADF of 2%. The BS sets minimum standards of 1% for bedrooms, 1.5% for living rooms and 2% for kitchens.

The analysis of the internal space of the proposed development indicates that all the rooms comfortably exceed the acceptable criteria of both the BRE Guide and as also set within BS 8206-2 in terms of Average Daylight Factor. The results are summarised in the table below.

Unit	Room	ADF	Criterion	BRE Compliant
1	Kitchen/Living	2.0	2.0	YES
	Bedroom	2.75	1.0	YES

Table 4: *ADF results*

Below are shown the graphic results of the Average Daylight Factor calculations of Flat 1



Figures 9: *ADF Ground Floor*

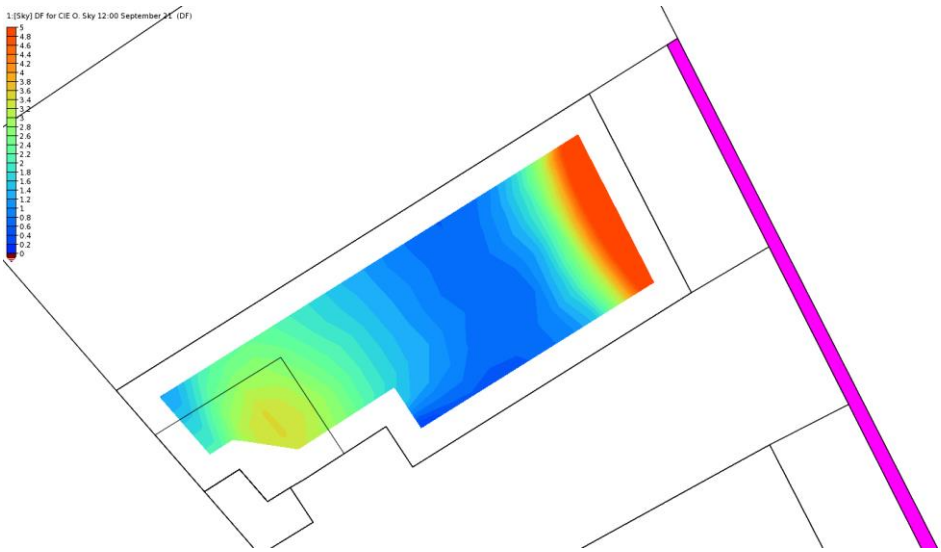


Figure 10: ADF Lower Ground Floor

5.2 Proposed Floor Plans and Section Drawing

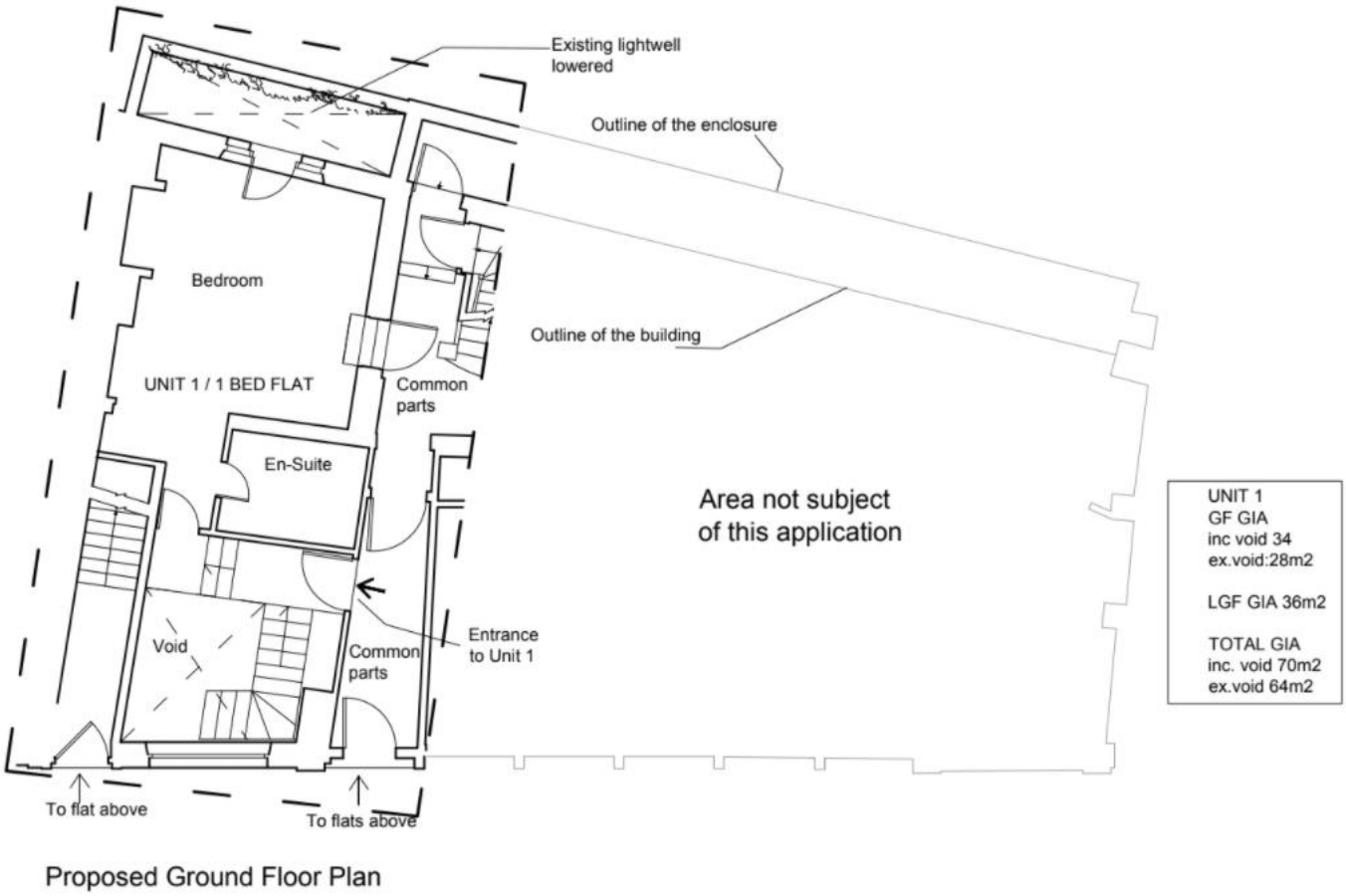


Figure 10: Proposed Ground Floor Plan

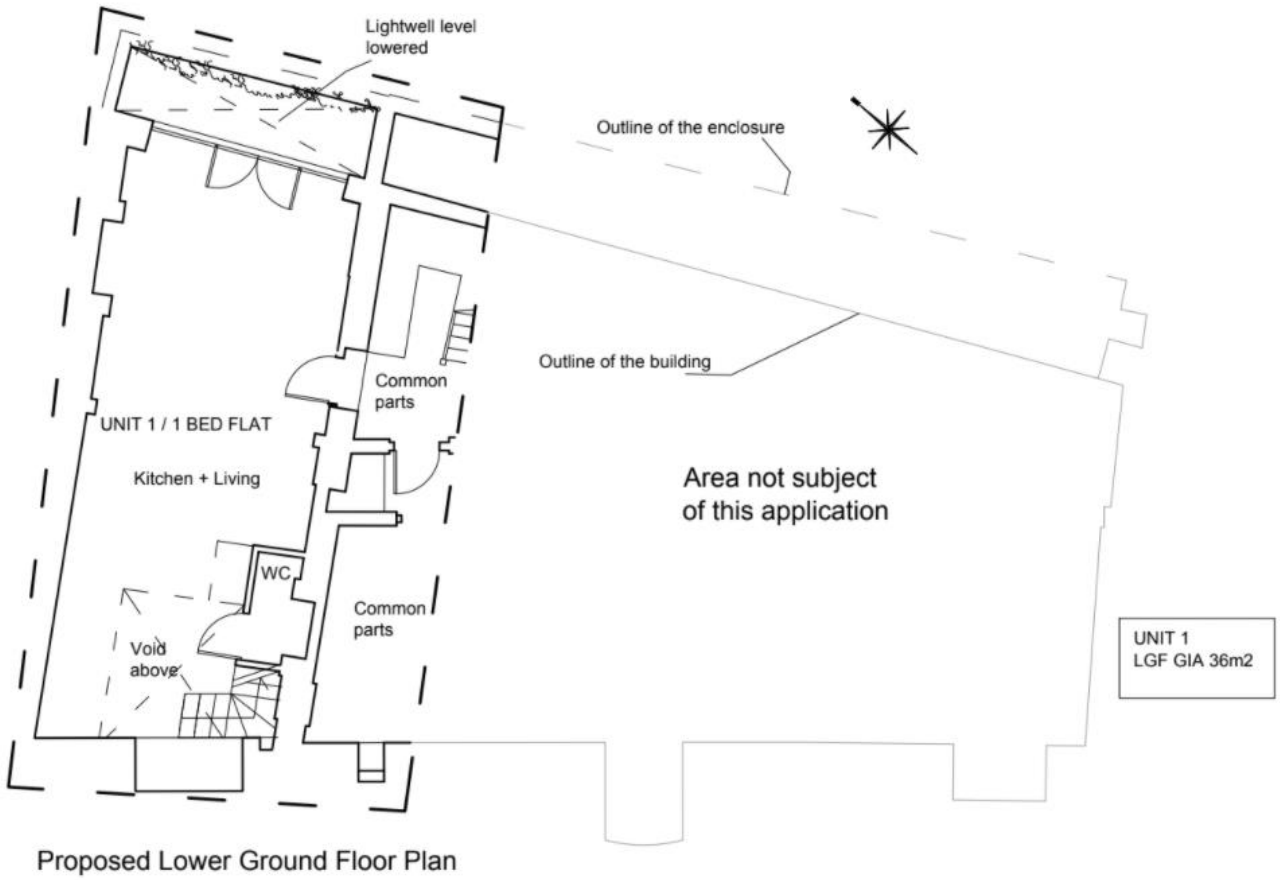


Figure 10: Proposed Lower Ground Floor Plan

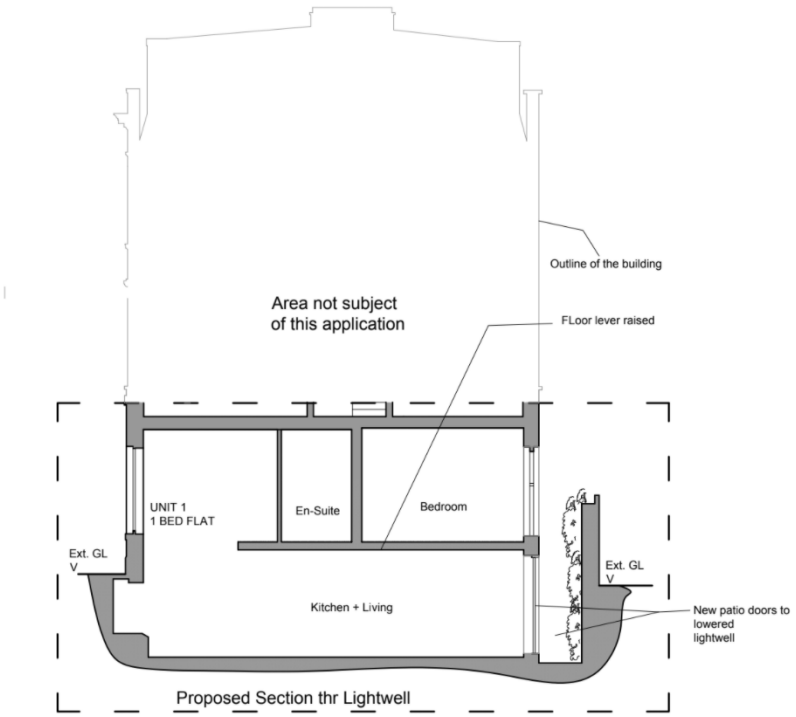


Figure 10: Proposed Section

6. CONCLUSION

The Average Daylight Factor (ADF) for the internal spaces of the proposed development 313, Royal College Street, London NW1 9QS has been carried out as part of this assessment. We conclude that daylight within the proposed habitable rooms are adequate and exceed the target criteria set within BS 8206-2 and BRE publication “Site Layout Planning for Daylight & Sunlight – A guide to good practice” [Section 5.1].

In light of the above, it is considered that sunlight/daylight should not be a constraint to the granting of planning permission.

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