



Riverside Road, London

Internal Daylight Assessment

PDA Planning & Development Associates



RIVERSIDE ROAD, LONDON

Internal Daylight Assessment

MACH Acoustics Ltd

3rd Floor 1 York Court
Upper York Street
Bristol
BS2 8QF
0117 944 1388

Eagle House
163 City Road
London
EC1V 1NR
0203 488 4559

info@machacoustics.com
www.machacoustics.com

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EXECUTIVE SUMMARY

MACH has carried out a detailed assessment of the internal daylight levels at the proposed Riverside Road development in London. The following bullet points provide a summary of the analysis carried out:

- It is understood that the proposed design will include the construction of a new residential property at the side of the existing 31 Lockmead Road. It is understood that information is required regarding the daylight levels within the proposed basement level.
- A 3D daylight model has been constructed and assessed for the proposed basement within the site, as per the provided drawings.
- An assessment of the basement spaces has yielded two room dimensions that will achieve Average Daylight Factors equal to or above 1%, which is suitable for bedroom or study use.

Overall, it is considered that the proposed development's basement will be able to include two separate spaces that both achieve the targeted daylight levels. These rooms can be used as studies or bedrooms based on BRE guidance targets, and the rest of the floor can be used for non-daylight critical spaces such as a storage area, TV room, gym, bathroom, utility, etc.



Figure 0.1 View of the Existing site

1.0 INTRODUCTION

This report outlines an internal daylight assessment for the proposed development at Riverside Road London.

This report provides an assessment of the quality of internal daylight levels within the basement study room.

This document details the methodology and results of the daylight assessment carried on the space mentioned above. The assessment has been carried out using Sketchup 3D modelling software and IES. The report details the modelling carried out to determine the level of daylight received in the assessed room.

Note: The assessment has been carried out as per the architectural drawings provided by PDA Planning & Development Associates.

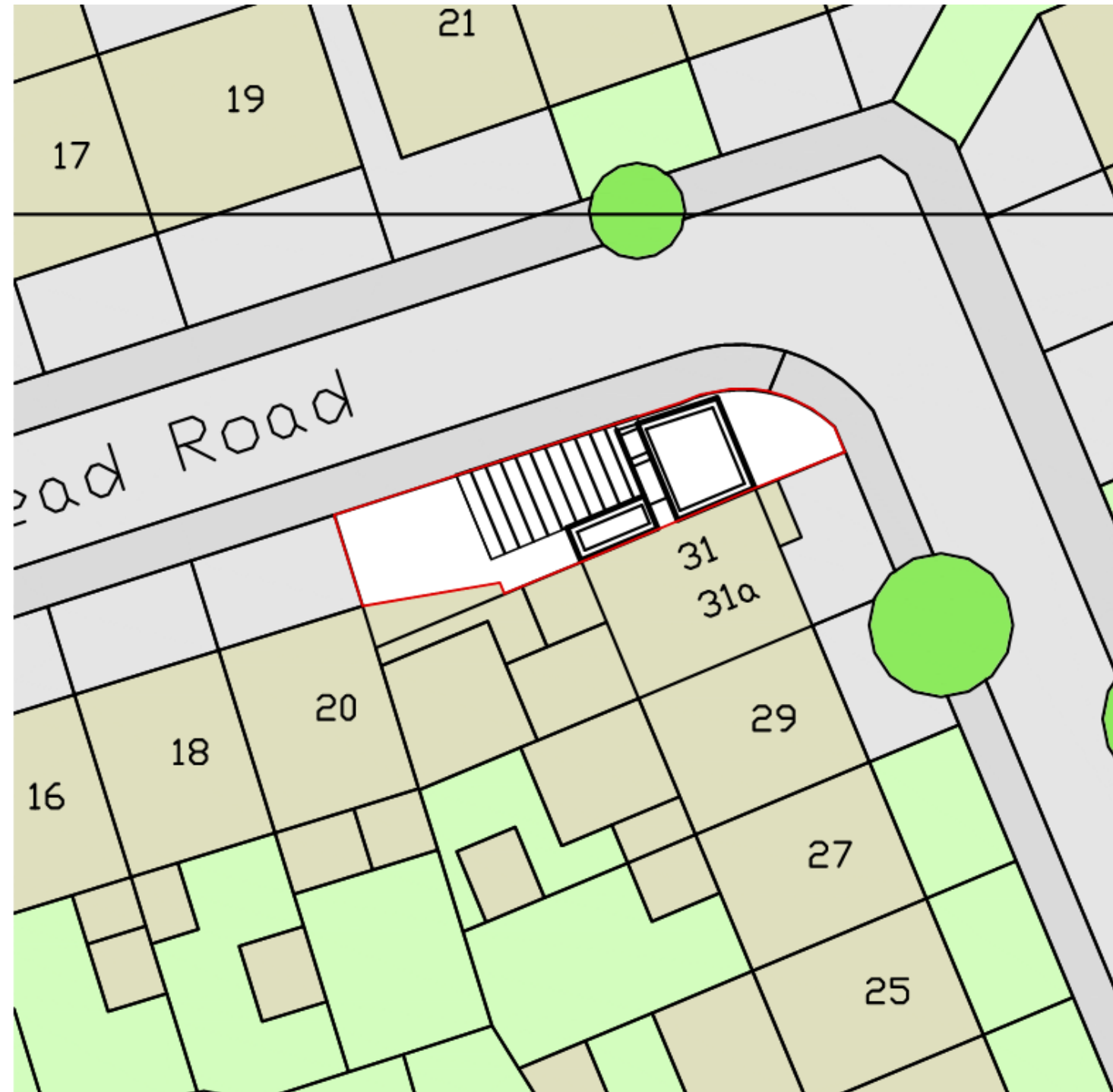


Figure 1.1: Site Plan of the Proposed Site

2.0 ASSESSED DEVELOPMENT

The figure to the opposite represents the floor plans of the proposed development.

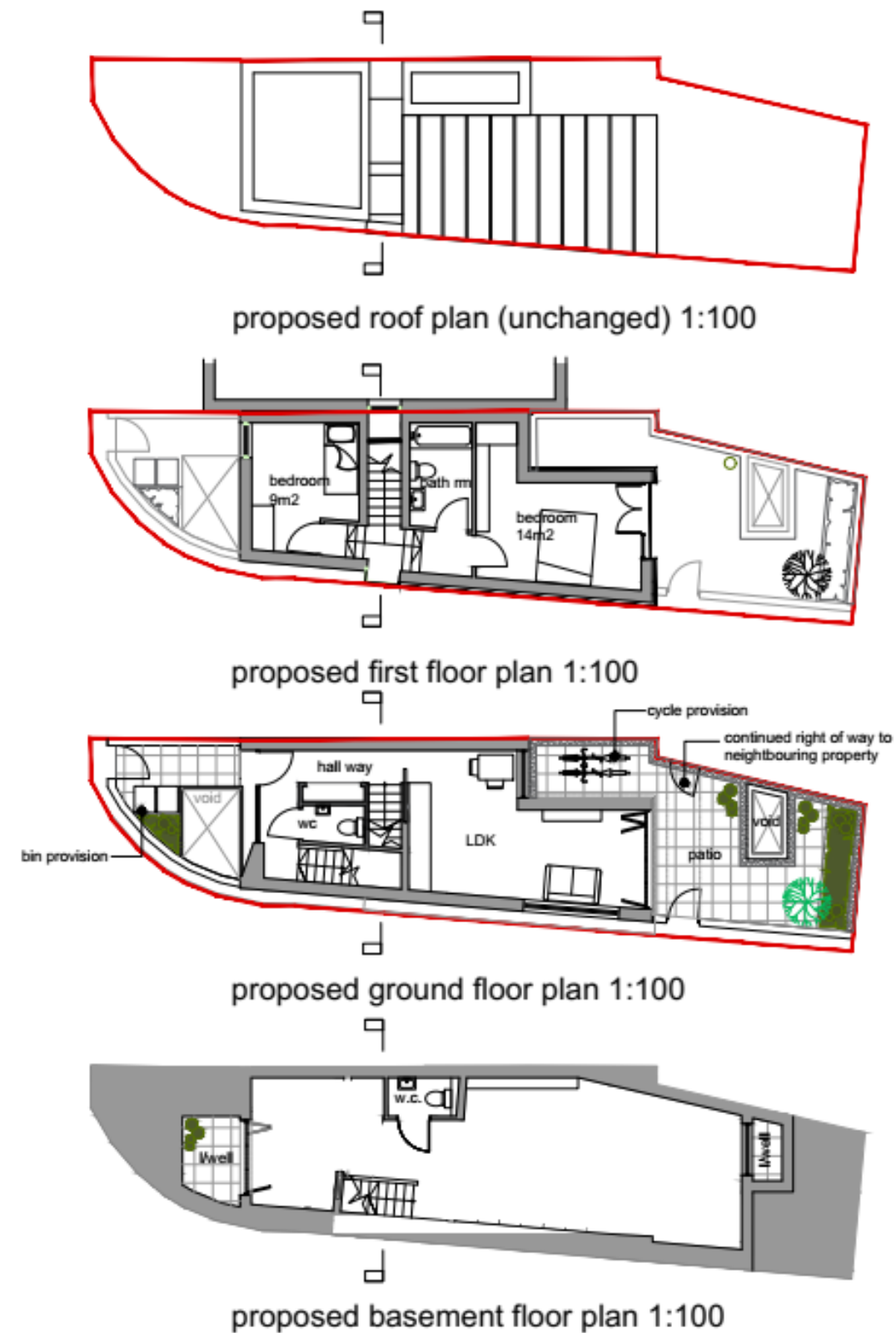


Figure 2.1: Floor Plans of the Proposed Development

The figures to the opposite represent the elevations and sections through the proposed development.

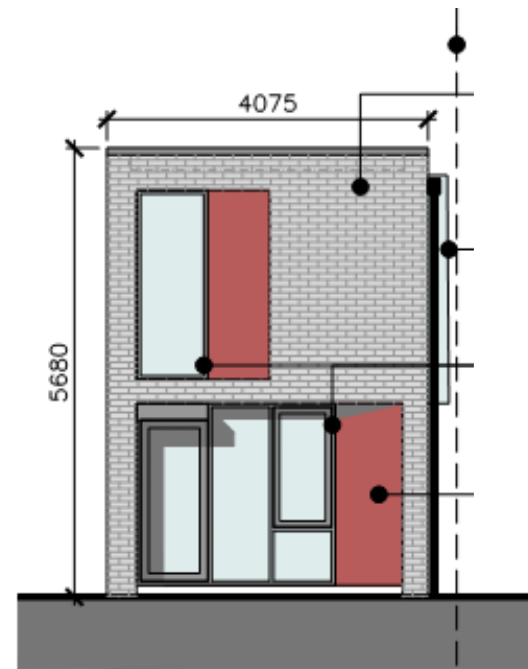


Figure 2.2: Front elevation of the Proposed Development

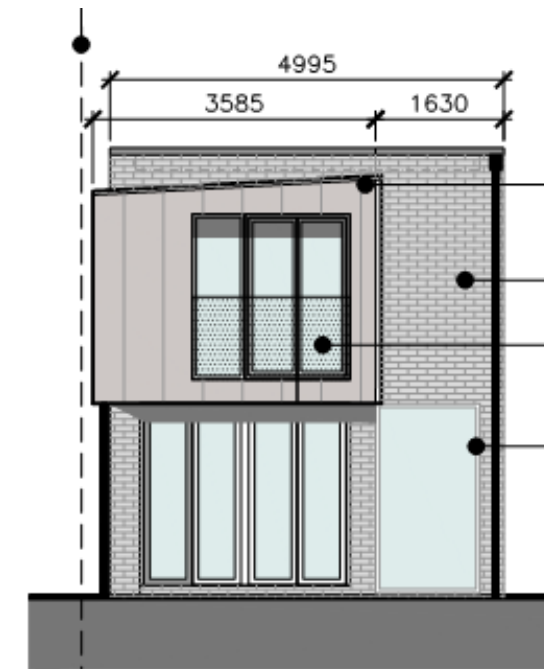


Figure 2.3: Rear elevation of the Proposed Development

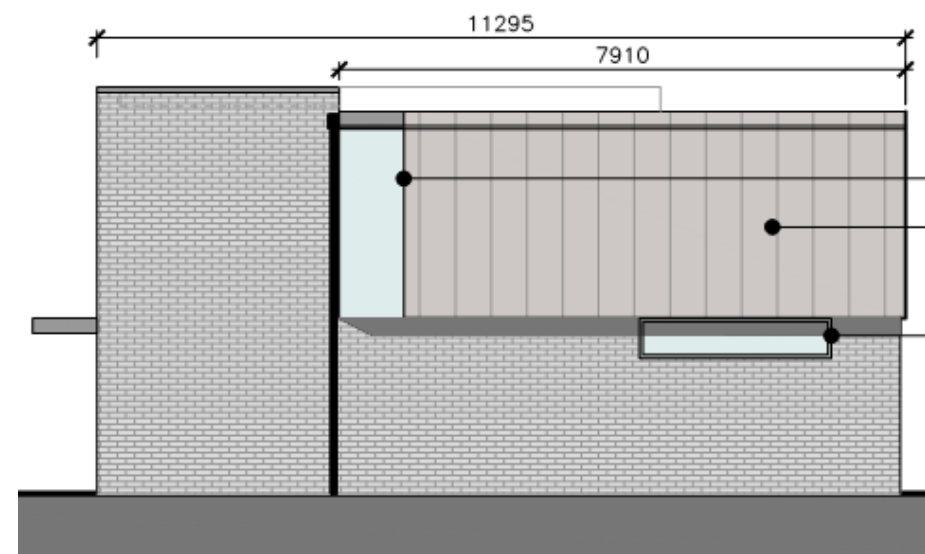


Figure 2.4: Side elevation of the Proposed Development

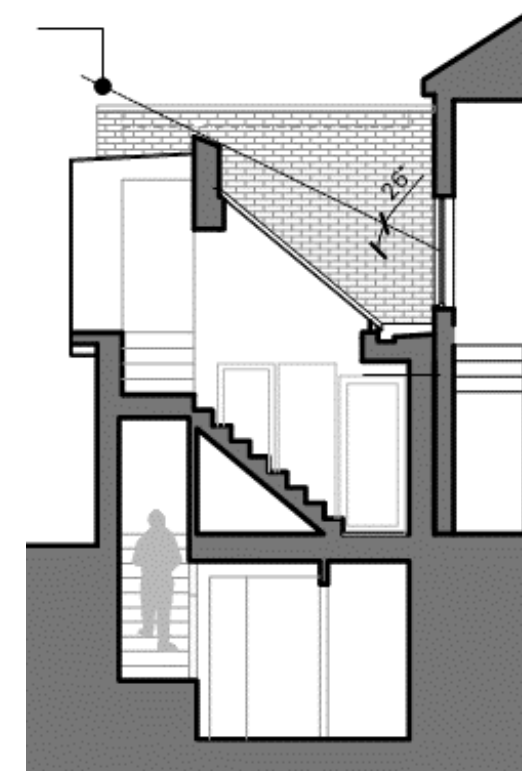


Figure 2.5: Section through the Proposed Development

3.0 ASSESSMENT CRITERIA

3.1 BRE – Site Layout Planning for Sunlight and Daylight: A Guide to Good Practice (2011)

The BRE document states that the daylight criteria should only apply to living and occupied areas within the development, which includes kitchens, living rooms and bedrooms. As such, an assessment for the proposed development will be carried out for the Living Area/Kitchen and Bedroom.

Adoption of BRE Guidance

It is important to note that the guidance provided within BR209 is for recommendation only, and thus not a strict set of targets that needs to adhere to at all locations. It is acknowledged in the document that sites of high density or historical context may be particularly restricted by the guidance within the document, and as such alternative performance targets may be suitable.

Average Daylight Factor

The most effective way to assess the quality and quantity of daylight within a living area is by calculating the Average Daylight Factor (ADF). The ADF, which measures the overall amount of daylight in space, is the ratio of the average illuminance on the working plane in a room to the illuminance on an unobstructed horizontal surface outdoors, expressed as a percentage.

The ADF considers the Visual Sky Component (VSC) value, i.e. the amount of daylight received on windows, the size and number of windows, the diffuse visible transmittance of the glazing used, the maintenance factor and the reflectance of the room surfaces. Therefore, it is considered as a more detailed and representative measure of the daylight levels within a living area. In housing, BS 8206-2 recommends minimum values of ADF of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms.

Summary of Targets

For this study, only the Average Daylight Factor has been considered. ADF is a complex and representative calculation as it considers the angle of visible sky reaching the windows as well as the room layout, use and surface reflectance.

A summary of the relevant performance targets is provided in the table below.

Measure of Interior Daylight	Benchmark	Daylight Criterion
Average Daylight Factor	1.5 – 2.0 %	Typical value of ADF for living rooms/kitchens. <i>Where this value is not achieved across the whole floor area, FF&E and room layout should position seating/lounge areas in daylight areas above 1.5 – 2.0% ADF.</i>
	1.0 %	Typical value of ADF for bedrooms. <i>Where this value is not achieved across the whole floor area, FF&E and room layout should position desks in daylight areas above 1.0% ADF.</i>

Table 3.1: Summary of BRE internal daylight criteria

Applying BRE Guidance to the Proposed Development

The use of internal space in the development should be considered, as BRE provides daylight parameters for living rooms and kitchens separately. However, it does not provide guidance on dual-use spaces as seen in the proposed development. As the floor area of living spaces is larger than kitchen areas, it is recommended that a daylight factor above 1.5% is seen as acceptable. For the assessment ADF target of 1.5% for lounge/kitchen space has been used.

4.0 ASSESSMENT MEASURES

4.1 Daylight Model

A 3D model of the assessed development and its adjacencies has been created within thermal modelling software IES, which has been used to carry out the daylight assessment within the proposed study room. The model takes into account the geometry and internal finishes of assessed room, as well as the shading from adjacent shading surfaces.

Note: The assessment has been carried out as per the architectural drawings provided by PDA Planning & Development Associates.

4.2 Model Inputs

The internal finishes of each space have been assumed as the following;

- Floors – Light grey carpet
- Walls – Painted white
- Ceiling – Painted white

In addition, a few assumptions have been made within the model;

- Wall thickness is assumed to be 0.30m thick.
- As per BRE guidance, a working plane has been set at 0.80 the proposed study room above the finished floor level.
- The proposed double glazing has an assumed diffuse visible transmittance of 0.70.

The images to the opposite provide screenshots of the daylight model built within thermal modelling software IES.

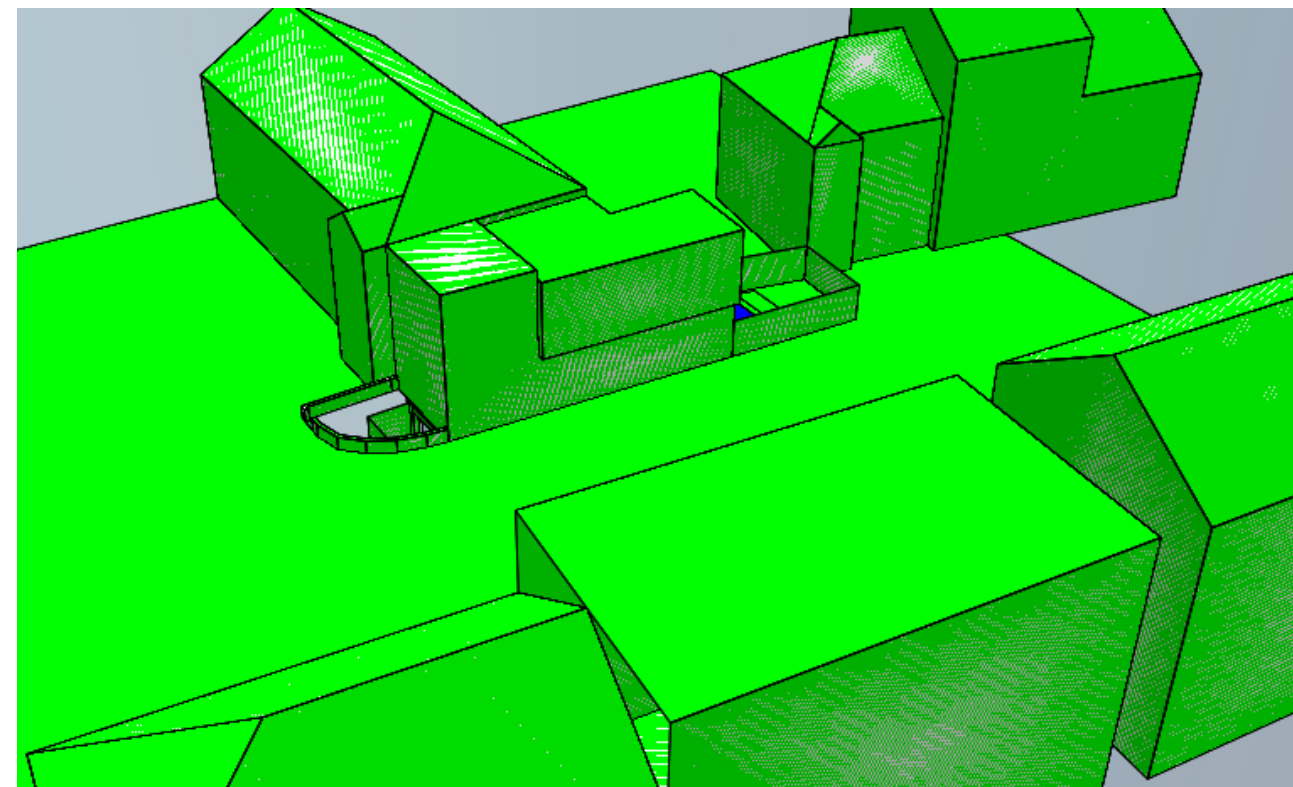


Figure 4.1: 3D View-1 of the daylight model of the Proposed Development

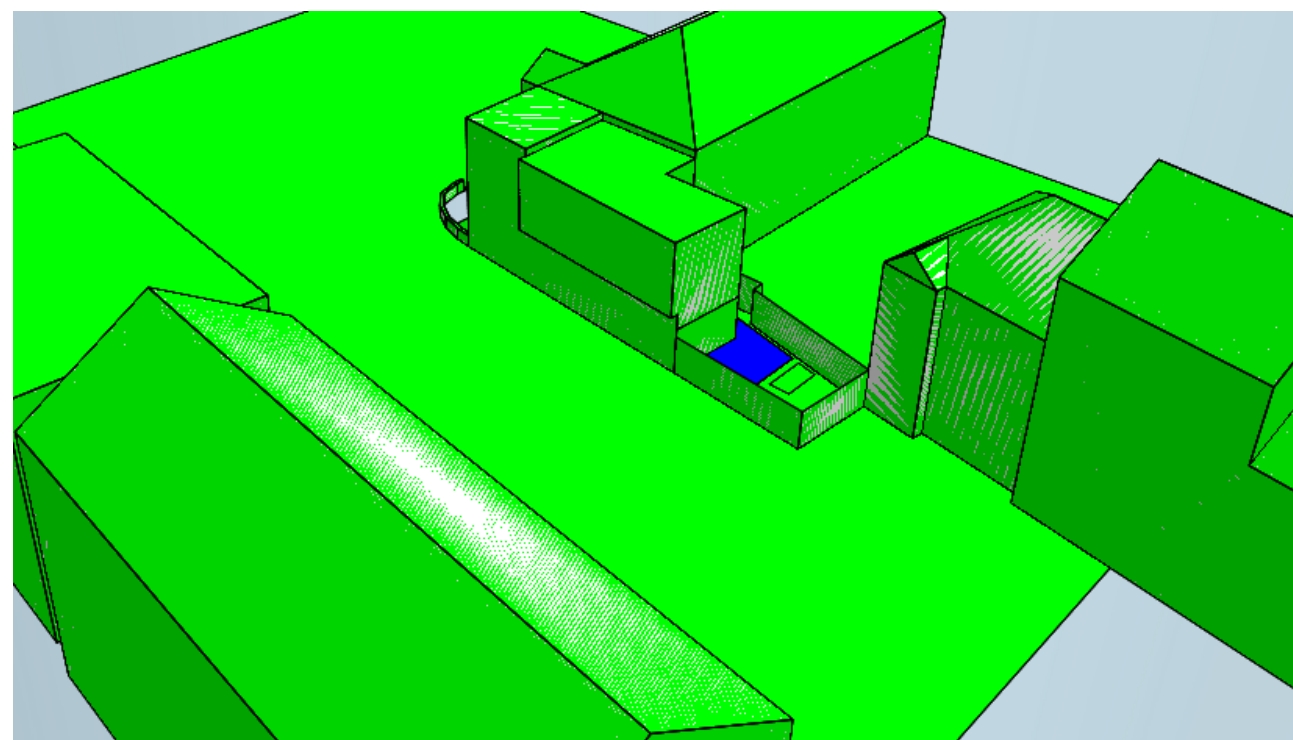


Figure 4.2: 3D View-2 of the daylight model of the Proposed Development

5.0 ASSESSMENT RESULTS

MACH has assessed the daylight levels for the proposed development's basement, based on the provided floor plans. Through an iterative process, MACH have established the maximum room depths that allow for an Average Daylight Factor (ADF) of more than 1%, so to be suitable for a bedroom or study.

Figure 5.1 shows an initial model of the basement which does not contain any partitions to assess whether the space requires separating into different rooms to achieve targeted daylight levels. The table below shows the predicted ADF.

Floor	Room	Target ADF (%)	Predicted ADF Results (%)
Basement	N/A 1	1.0%	0.64

Table 5.1: Basement Floor ADF – No Room Separation

As the whole floor's ADF is lower than the targeted value, MACH has investigated different room sizes around the two sources of natural light.

To determine the maximum depth for each room to obtain an ADF of 1%, different geometries were modelled and assessed iteratively. The final geometry simulation results are shown in Table 5.2. The associated daylight factor plots have also been included to the right.

Floor	Room	Target ADF (%)	Predicted ADF Results (%)
Basement	Space 1	1.0%	1.4
Basement	Space 2	1.0%	1.0

Table 5.2: Basement Room ADF

The investigation has yielded two room depths for the assessed spaces, as indicated on Figure 5.2 and Figure 5.3. The depth for space 1 can be increased further to achieve an ADF closer to 1%, however, this would result in a larger room with worse lighting distribution with some areas seeming dark without the use of additional lighting. Therefore, the space has been limited to a wall at the bottom of the basement stairs found on a previous issue of the floor plans.

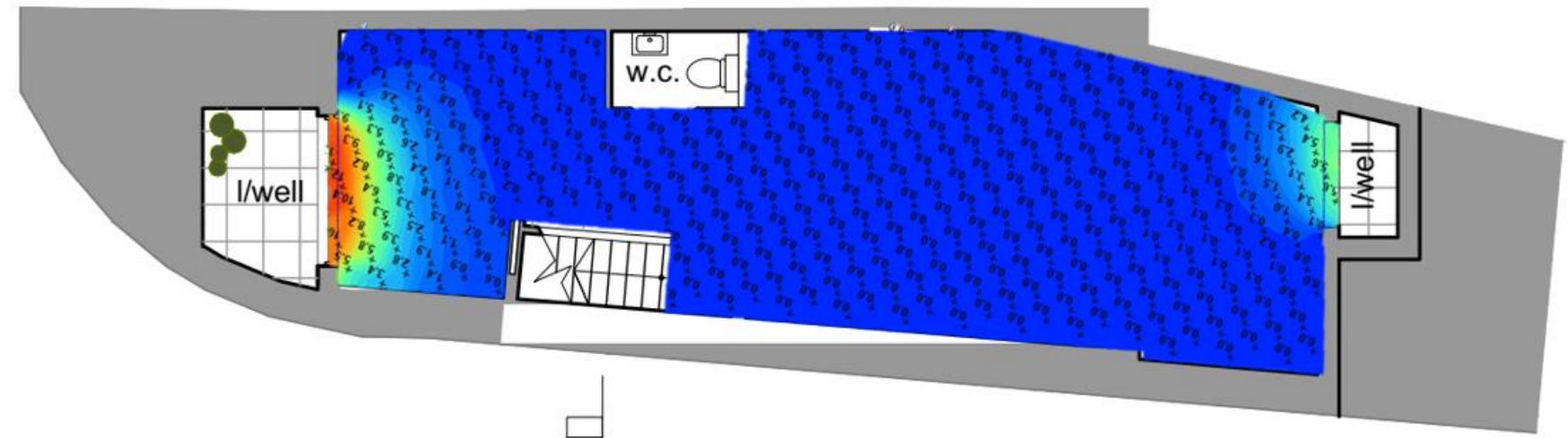


Figure 5.1: Basement Floor Daylight Factor Plot

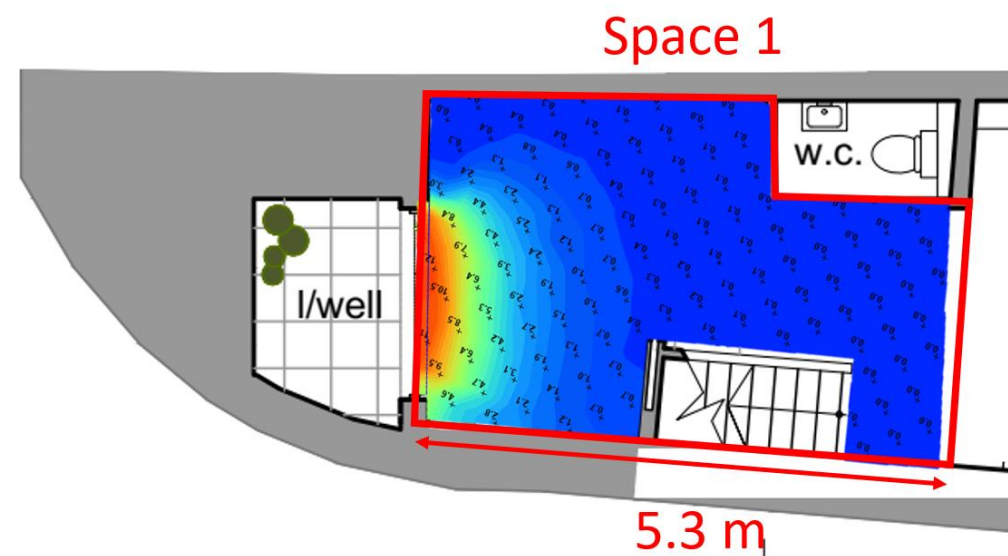


Figure 5.2: Space 1 Daylight Factor Plot

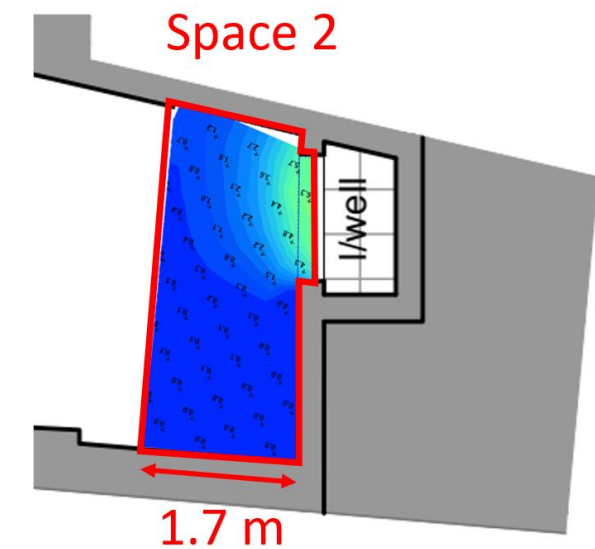


Figure 5.3: Space 2 Daylight Factor Plot



APPENDIX A – SITE PHOTOS & REFERENCES

The site photos to the opposite show aerial and architects modelled views to the proposed site and development.

