SUSTAINABILITY & ACOUSTICS

16 CHERRY LANE, BRISTOL

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Internal Daylight Assessment

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CONTENTS

EXECUTIVE SUMMARY

MACH has carried out a detailed assessment of the internal daylight conditions for the proposed refurbishment of the ground floor at 16 Cherry Lane involving the conversion of an existing retail unit into a one-bedroom flat. The key findings are as follows:

- A 3D daylight model of the proposed development has been created, with daylight-sensitive rooms within the dwelling assessed.
- The assessment has been carried out in accordance with the latest (2022) BRE guidance (BR 209) to evaluate the internal daylight performance.
- The assessed rooms comfortably meet the recommended criteria set out in the BRE guidance.
- The internal layouts have been designed with daylight access in mind, ensuring that primary living spaces are positioned close to windows to maximise natural light availability.

Overall, the proposed development demonstrates a good standard of daylight design, with both daylight sensitive spaces achieving adequate levels of daylight in line with current best practice guidance.

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Figure 0.1: Top View of the Site (in red)

Room Type	Total Number of Spaces Assessed	Daylight Distribution	
		Number of spaces meeting BRE criteria	Percentage Achieving BRE Compliance
Living Room	1	1	100%
Bedroom	1	1	100%
Total	2	2	100%

Table 0.1 Summary of the Internal Daylight Assessment Result

1.0 INTRODUCTION

This report presents the findings of an internal daylight assessment for the proposed redevelopment at 16 Cherry Lane. The daylight-sensitive spaces within the proposed dwelling have been assessed.

The purpose of this assessment is to evaluate the quality of internal daylight levels within the proposed living spaces and provide guidance on their adequacy.

The analysis was undertaken using SketchUp 3D modelling software with MBS Daylight for SketchUp plug-in. This report outlines the modelling approach used and the daylight levels achieved in the assessed rooms.

Note: The assessment has been based on the architectural drawings provided at the time of modelling.

2.0 PROPOSED DEVELOPMENT

The proposed development involves the conversion of an existing retail space into a one-bedroom residential flat and amenities such as bicycle and bin storage.

The site is located on Cherry Lane in Stokes Croft, an inner city area of Bristol. The surrounding area is predominantly urban in character, comprising a mix of residential and commercial developments. The site is bordered by buildings of varying heights and forms, which have been considered as part of the daylight modelling to ensure an accurate representation of the existing context.

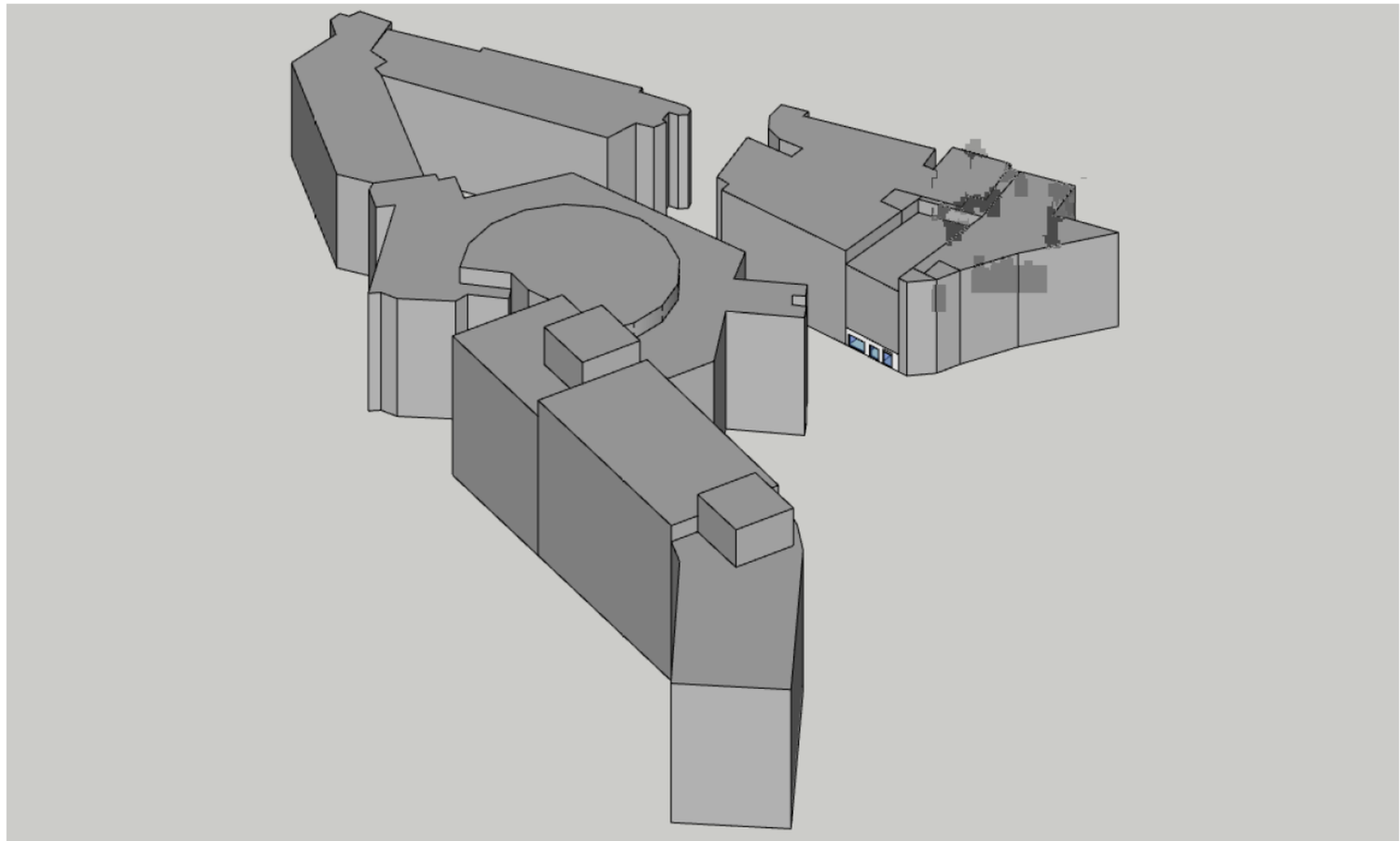


Figure 2.1: Daylight Model with Surrounding Buildings (Assessed Dwelling in White)

The figures below represent the provided drawings of the proposed development.

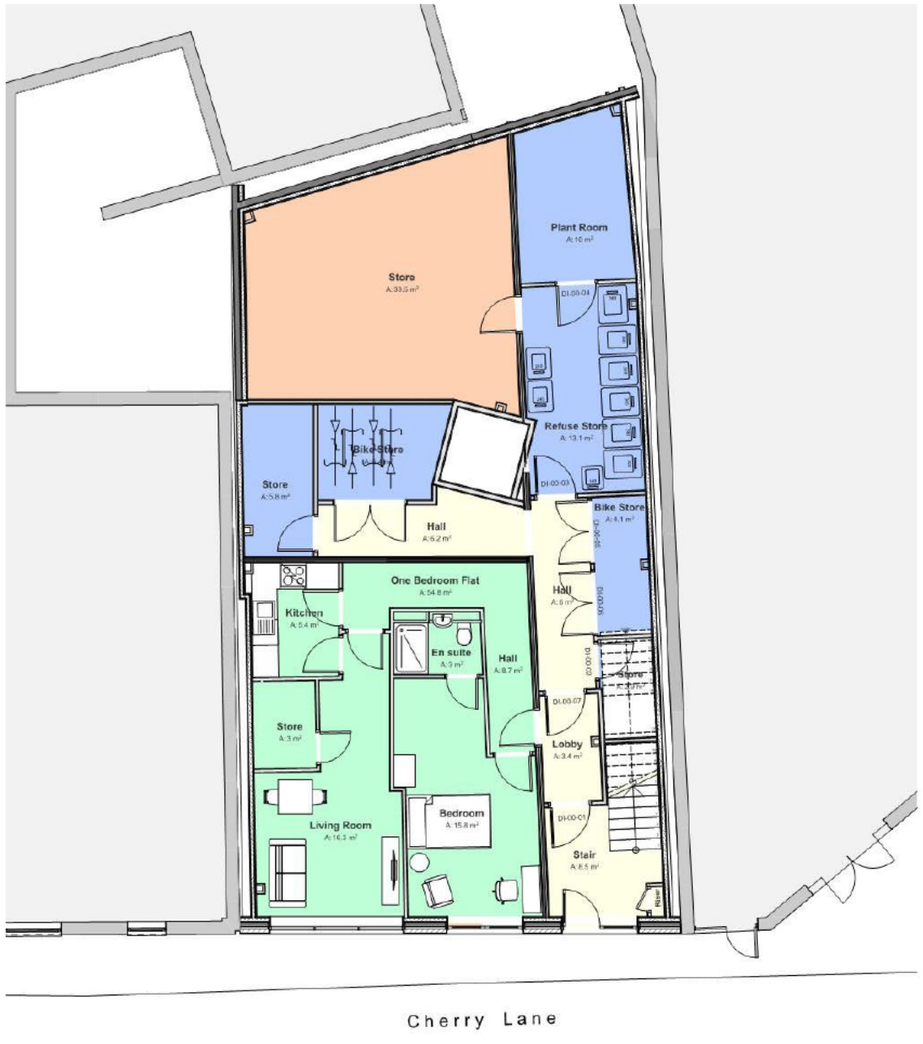
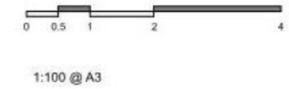
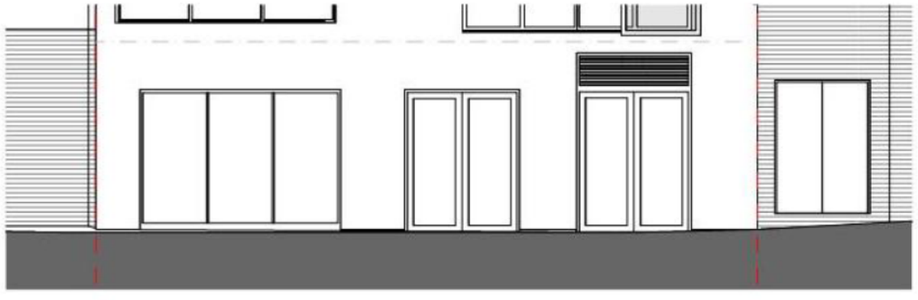


Figure 2.2: Proposed Ground Floor Plan





Proposed Cherry Lane Elevation

Figure 2.3: Proposed Elevation

3.0 POLICIES & ASSESSMENT METHODOLOGY

3.1 BRE – Site Layout Planning for Sunlight and Daylight: A Guide to Good Practice (2022)

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 and Bedroom.

3.1.1.1 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.

3.1.2 Daylight

3.1.2.1 Daylight Factor Distribution

The Daylight Factor Distribution method, as outlined in BR209 (2022), assesses the proportion of a room that receives adequate daylight. This approach ensures that a specified daylight factor is achieved over a defined calculation area, reflecting the daylight availability across the space rather than relying solely on an averaged figure. The criteria vary depending on the geographical location of the development and the intended function of the assessed room.

3.1.2.2 Summary of Targets

For this study, the Daylight Distribution assessment, as recommended in BR209 (2022), has been applied. This method provides a robust measure of internal daylight conditions by evaluating the extent to which daylight permeates the room, ensuring compliance with contemporary best practice. As the 2022 guidance supersedes previous methodologies, it has been adopted as the primary assessment standard for this report.

As there is currently no published local daylight guidance for Bristol, the Birmingham daylight targets have been adopted as a reasonable and regionally comparable benchmark for this assessment.

Measure of Interior Daylight	Room Type	Benchmark	Daylight Criterion
Daylight Distribution (2022)	Bedroom	0.6% D_T / 50% area	Target Daylight Factors to achieve over at least 50% of the assessed area of a Bedroom.
	Living Room	0.9% D_T/ 50% area	Target Daylight Factors to achieve over at least 50% of the assessed area of a Living Room.
	Kitchen	1.2% D_T/ 50% area	Target Daylight Factors to achieve over at least 50% of the assessed area of a Kitchen.

Table 3.1: Summary of BRE Internal Daylight Criteria (Birmingham 2022)

4.0 ASSESSMENT MEASURES

4.1 Daylight Model

A 3D model of the assessed development and its adjacencies have been created within SketchUp, which has been used to carry out the daylight assessment within each space using the extension known as MBS. The model takes into account the geometry and internal finishes of assessed rooms, as well as the shading from adjacent shading surfaces. The images to the opposite provide screenshots of the built daylight model.

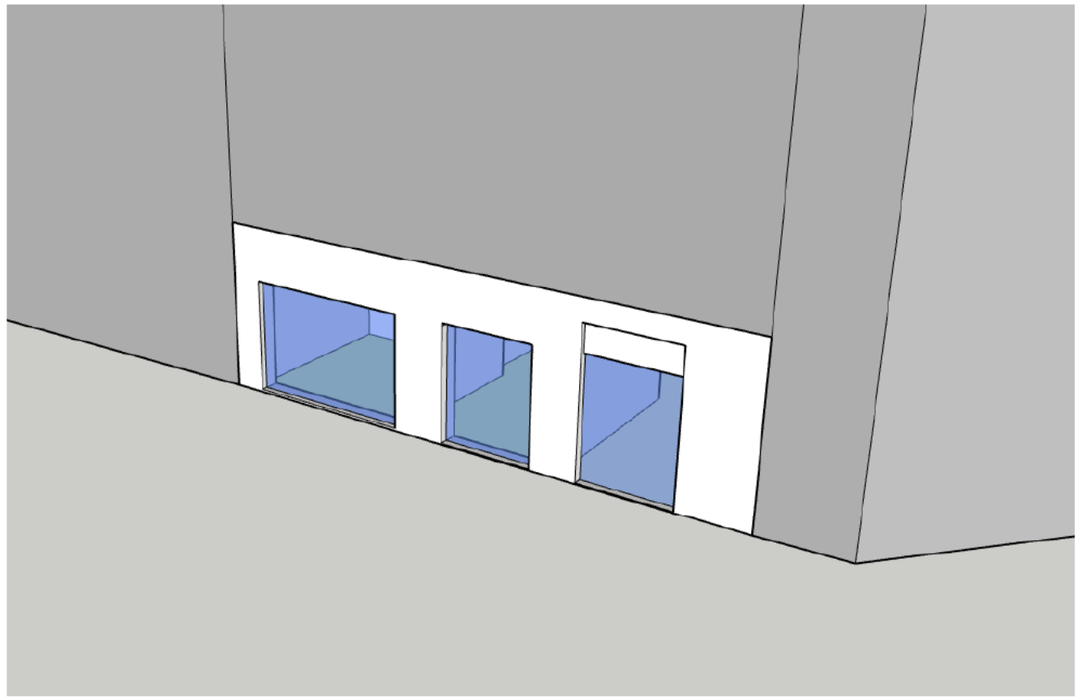


Figure 4.1: Street Level View of The Daylight Model of The Proposed Development (White) and Adjacent Buildings (Grey)

4.2 Model Inputs

4.2.1 Surface

The surface reflectance has been assumed as the following as BRE guidance.

Surface	Finishing	Reflectance
Floors	Vinyl Flooring	0.4
Interior Walls	Painted White	0.6
Ceilings	Painted White	0.8

Table 4.1: Summary of Surface Reflectance

4.2.2 Glazing

No internal blinds have been assigned to any windows at this stage.

Glazing Type	Visible Light Transmittance
External Window	0.68
Maintenance Factor	0.92

Table 4.2: Summary of Glazing Transmittances

4.2.3 Assessment Grid

Criteria	Description
Height of working plane above finished floor level	0.85m
Maximum point offset from wall	0.30m
Maximum grid spacing	0.20m

Table 4.3: Summary of the Assessment Methodology

5.0 RESULTS

5.1 Daylighting Results Summary

A summary of the internal daylight assessment results is provided in Table 5.1.

The results demonstrate that the assessed spaces comfortably meet the criteria set out in the 2022 BRE guidelines (BR 209). The proposal retains the original large window openings of the retail unit, thereby supporting good levels of natural daylight within the new accommodation.

As the kitchen is an internal space, it is not considered a daylight-sensitive area in accordance with BRE guidelines and has therefore been excluded from this assessment.

In conclusion, the proposed development demonstrates good daylight design. The combination of efficient internal layouts and reflective internal finishes ensures that a high standard of daylighting is achieved across both the rooms.

Room Type	Room Ref.	Internal Daylight Assessment Results			
		Daylight Distribution (BRE 2022 Guidance)			
		BRE Criteria		Predicted Results	BRE Compliance
		Required Daylight Factor (DF)	Minimum Grid Area	Percentage of area above the required Daylight Factor	
Bedroom	16 Cherry Lane- Ground: R1	0.60	50%	100%	Pass
Living Room	16 Cherry Lane- Ground: R2	0.90	50%	100%	Pass

Table 5.1: Daylight Distribution Results of the Assessed Spaces

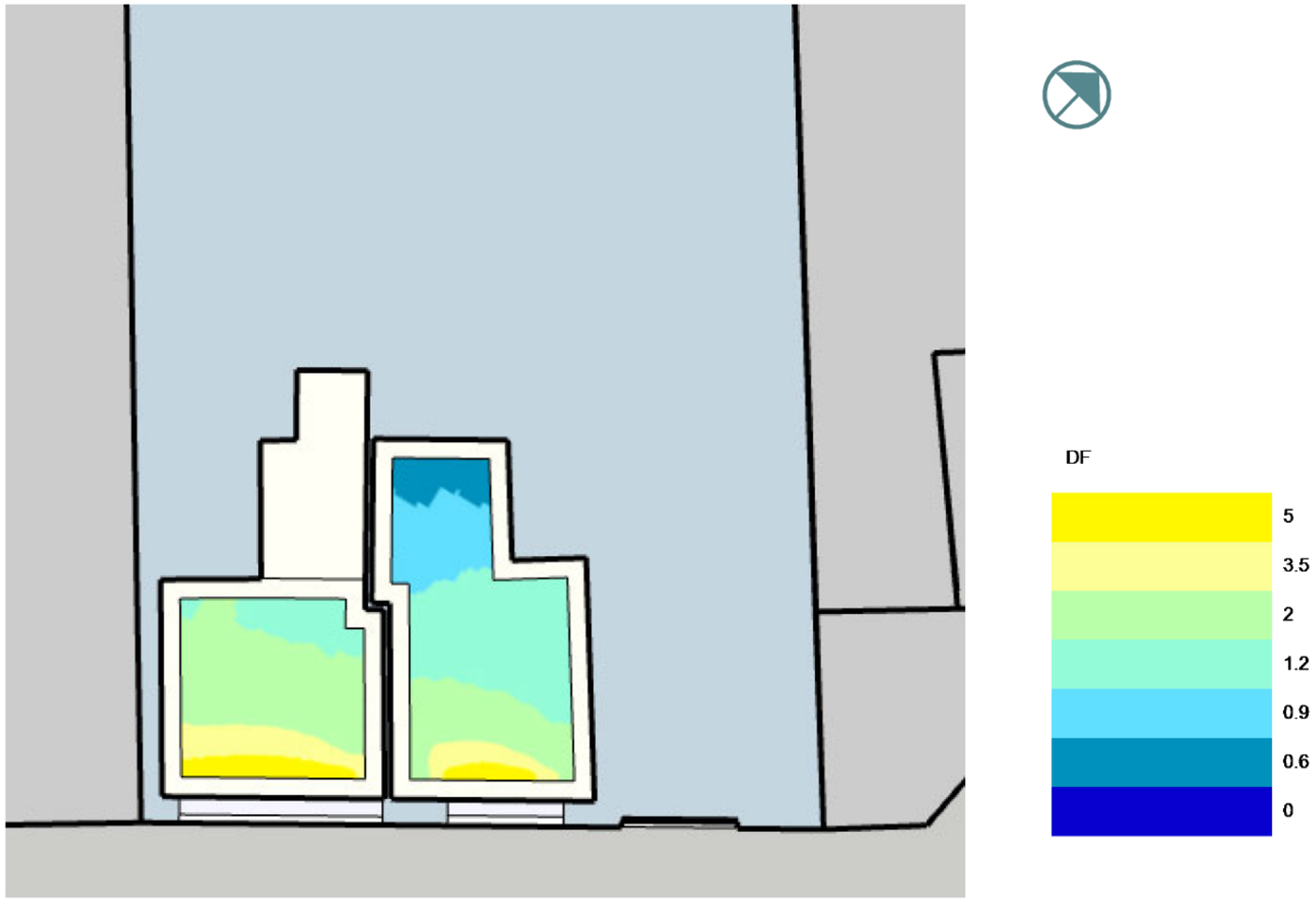


Figure 5.1: Ground Floor Daylight Markup