

Client: Manor Hall Property Ltd

Daylight and Sunlight Assessment Provision for the Development at 40-42 Mill Lane, London

December 2020

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Daylight and Sunlight Provision Assessment for the Development at 40-42 Mill Lane, London Contents Amendment Record

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1 Background and Scope of Appraisal

1.1 Study Objectives

Herrington Consulting has been commissioned by Manor Hall Property Ltd to analyse and quantify the provision of natural daylight and sunlight to the habitable rooms within the proposed development at 40-42 Mill Lane, London.

1.2 Site Location

The site is situated in the area of Camden and is located within the London Borough of Camden. The location of the site is shown in Figure 1.1 and the site plan included in Appendix A.1 of this report gives a more detailed reference to the site location and layout.



Figure 1.1 – Location map (Contains Ordnance Survey data © Crown copyright and database right 2011)

1.3 The Development

The proposal for development is to create two self-contained flats at the ground and lower ground floor of the existing public house. Drawings of the proposed scheme are included in Appendix A.1 of this report.



2 Policy and Guidance

2.1 National Planning Policy

National Planning Policy Framework (Revised February 2019)

Paragraph 123 on 'Achieving appropriate densities' states that "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)."

2.2 Regional Planning Policy

The London Plan – Spatial Development Strategy for London (2016)

Policy 7.6: 'Architecture' of the adopted London Plan, includes the following statements: "Buildings and structures should... not cause unacceptable harm to the amenity of surrounding land and buildings, particularly residential buildings, in relation to... overshadowing.". "New development, (...) should not have a negative impact on the character or amenity of neighbouring sensitive land uses".

The London Plan – Supplementary Planning Guidance on Housing (2016)

Policy 7.6Bd on 'Standards for privacy, daylight and sunlight' states that 'An appropriate degree of flexibility needs to be applied when using BRE guidelines to assess the daylight and sunlight impacts of new development on surrounding properties, as well as within new developments themselves. Guidelines should

be applied sensitively to higher density development, especially in opportunity areas, town centres, large sites and accessible locations, where BRE advice suggests considering the use of alternative targets'

Furthermore, Paragraph 2.3.47 on 'Daylight and Sunlight' includes the following statement '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 on 'Daylight and Sunlight' 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'.

2.3 Local Planning Policy

Camden Local Plan (2017)

Paragraph 8.16 under Resource efficiency, demolition and retrofitting existing buildings: 'The construction process and new materials employed in developing buildings are major consumers of resources and can produce large quantities of waste and carbon emissions. The possibility of sensitively altering or retrofitting buildings should always be strongly considered before demolition is proposed. Many historic buildings display qualities that are environmentally sustainable and have directly contributed to their survival, for example the use of durable, natural, locally sourced materials, 'soft' construction methods, good room proportions, natural light and ventilation and ease of alteration.'



2.4 Best Practice Guidance

In the absence of official national planning guidance / legislation on daylight and sunlight, the most recognised guidance document is published by the Building Research Establishment and entitled 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice', Second Edition, 2011; herein referred to as the 'BRE Guidelines'.

The BRE Guidelines are not mandatory and themselves state that they should not be used as an instrument of planning policy, however in practice they are heavily relied upon as they provide a good guide to approach, methodology and evaluation of daylight and sunlight impacts.

In conjunction with the BRE Guidelines further guidance is given within the British Standard (BS) 8206-2:2008: 'Lighting for buildings - Part 2: Code of practice for daylighting'.

In this assessment, the BRE Guidelines have been used to establish the extent to which the Proposed Development meets current best practice guidelines. In cases where the Development is likely to reduce light to key windows the study has compared results against the BRE criteria.

Whilst the BRE Guidelines provide numerical guidance for daylight, sunlight and overshadowing, these criteria should not be seen as absolute targets. The document states that the intention of the guide is to aid rather than constrain the designer. The Guide is not an instrument of planning policy, therefore whilst the methods given are technically robust, it is acknowledged that some level of flexibility should be applied where appropriate.



3 Assessment Techniques

3.1 Background

Natural light refers to both daylight and sunlight. However, a distinction between these two concepts is required for the purpose of analysis and quantification of natural light in buildings. In this assessment, the term 'Daylight' is used for natural light where the source is the sky in overcast conditions, whilst 'Sunlight' refers specifically to the light coming directly from the sun.

3.2 Average Daylight Factor

The Average Daylight Factor (ADF) method calculates the average illuminance within a room as a proportion of the illuminance available to an unobstructed point outdoors under a sky of known luminance and luminance distribution. This is the most detailed of the daylight calculations and considers the physical nature of the room behind the window, including; window transmittance, and surface reflectivity.

This method of quantifying the availability of daylight within a room does, however, require the internal layout to be known and is generally only used for establishing daylight provision in new rooms. The BRE Guide sets out the following guidelines for the assessment of the ADF:

If a predominantly daylit appearance is required, then the ADF should be 5% or more if there is no supplementary electric lighting, or 2% or more if supplementary electric lighting is provided. In dwellings, the following minimum

average daylight factors should be achieved: 1% in bedrooms, 1.5% in living rooms and 2% in kitchens.

3.3 No Sky Line

The No Sky Line, or sometimes referred to as No Sky View method, describes the distribution of daylight within rooms by calculating the area of the 'working plane', which can receive a direct view of the sky. The working plane height is generally set at 850mm above floor level within a residential property and 700mm within a commercial property.

If a significant area of the working plane lies beyond the NSL, i.e. this area of the room has no view of the sky at the working plane height, there is likely to be a poor distribution of daylight within the room. However, this test is relatively simplistic and based purely on geometric parameters. Consequently, no account is taken of the reflectance of light within the room.

The BRE Guidelines do recommend that the NSL test is applied alongside the ADF test, and this is primarily to provide an indication of how well the daylight within the room is distributed. The determination of the level of adequacy of natural daylighting is, however, still predominantly driven by the ADF target values. Notwithstanding this, the NSL test does provide useful information on the way that the daylight is distributed within a room and this is often useful to the designer. The NSL test has therefore been undertaken alongside the ADF analysis and the graphical and numerical outputs are included within the appendix to this report. These results are, however, only used in a qualitative and informative way, rather than a quantitative pass/fail manner.



3.4 Room Depth Criteria

The BRE Guidelines do include advice for determining recommended room depths to proposed new rooms under specific circumstances using the Room Depth Criteria (RDC). This is more of a rule-of-thumb test that can be used to plan building layouts etc at an early conceptual stage, rather than providing quantitative outputs at the more detailed stage of a development.

This test has numerous limitations when being applied to anything but a simplistic room layout and does not take into account external obstructions. It is therefore not considered to provide any meaningful data on the level or distribution of daylight that is not already provided by the ADF and NSL tests. Consequently, it is only applied in very particular situations.

3.5 Annual Probable Sunlight Hours

It is also possible to quantify the amount of sunlight available to a new development and the recognised methodology for undertaking this analysis is the Annual Probable Sunlight Hours (APSH) method.

For a typical development to be considered as having very good levels of direct sunlight, the centre point of the window would ideally need to receive more than 25% of APSH for the year, including at least 5% in the winter months between 21st September and the 21st March. The BRE Guidelines also recommend having at least one main window of the proposed development facing within 90 degrees of due south, with priority given to living rooms where sunlight is especially appreciated in the afternoon. Bedrooms and kitchens are generally

viewed as less important, where occupants normally prefer sunlight in the mornings.

For new development and especially where existing buildings are being redeveloped, it is important to acknowledge that these are aspirational targets intended to aid and not constrain the designer.

3.6 Overshadowing

The BRE Guidance suggests that where new development is served by amenity areas, then analysis can be undertaken to quantify the amount of sunlight these amenity areas will enjoy. Typical examples of areas that could be considered as open spaces or amenity areas are main back gardens of houses, allotments, parks and playing fields, children's playgrounds, outdoor swimming pools, sitting-out areas, such as in public squares and focal points for views, such as a group of monuments or fountains.

Sun Hours on Ground

The BRE Guidelines recommend that for a garden or amenity area to appear adequately sunlit throughout the year, at least 50% of an amenity area should receive at least 2 hours of sunlight on 21st March.

When undertaking this analysis, sunlight from an altitude of 10° or less has been ignored as this is likely to be obscured by planting and undulations in the surrounding topography. Driveways and hard standing for cars is also usually left out of the area used for this calculation. Fences or walls less than 1.5 metres high are also ignored. Front gardens which are relatively small and visible from public footpaths are omitted with only main back gardens needing to be analysed.



The Guidelines also state that "normally, trees and shrubs need not be included, partly because their shapes are almost impossible to predict, and partly because the dappled shade of a tree is more pleasant than a deep shadow of a building". This is especially the case for deciduous trees, which provide welcome shade in the summer whilst allowing sunlight to penetrate during the winter months.



4 Assessment Methodology

4.1 Method of Baseline Data Collation

The following data and information has been used to inform this study:

- OS Mastermap mapping
- Measured survey data (Interlock Surveys April 2016)
- Scheme drawings in AutoCAD format (Ko Architects November 2020)
- Photographic information provided by Ko Architects (November 2020)
- Aerial photography (Google Maps and Bing)

4.2 Numerical Modelling

The numerical analysis used in this assessment has been undertaken using the Waldrum Tools (Version 5.0.0.3) software package.

4.3 Calculation Assumptions

The following assumptions have been made when undertaking the analysis:

When assessing the ADF for internal rooms and in the absence of specific information, the following parameters are assumed:

- The glazing type is assumed to be double glazing (Pilkington K Glass 4/16/4 Argon filled) with a light transmittance value of 0.78 (value for double glazed unit not per pane).
- Correction factor for frames and glazing bars = 0.8
- Where information from the designer is not available, the following values are used to derive the Maintenance Factor applied to the transmittance values.

Location / setting	Building type (Residential – good maintenance)	Exposure (normal)	Special exposure	Maintenance Factor	
Urban	8%	x 1.0	x 1.0	0.92	
Rural / suburban	4%	x 1.0	x 1.0	0.96	

Table 4.1 – Parameters used for deriving Maintenance Factor (refer to BS 8206-2:2008 Tables A3, A4 and A5)

The reflectance values used in the ADF analysis of the proposed new buildings are shown in table 4.2 below and are used unless specified otherwise by the designer:



Surface	Value
Internal walls (painted pale cream)	81%
Internal ceiling (painted white)	85%
Internal flooring	30%

Table 4.2 – Reflectance values used in ADF analysis

Where the results of the detailed analysis are presented in the appendix to 2 decimal places, these values may be rounded to a single decimal place when interpreting the results and discussing compliance with assessment criteria. This is to fit with the convention adopted within the BRE Guidelines where all ratio of change and absolute daylighting values are expressed to one decimal place.



5 Daylight Provision to Proposed New Rooms

5.1 Overview

As discussed in Section 4, the primary test for daylight is the Average Daylight Factor (ADF) test and this is discussed in detail in the following section. The No Sky Line (NSL) analysis has also been carried out to provide supporting information on the distribution of daylight within each of the habitable rooms. The NSL results are processed by the computational model in both graphical and numerical formats and these are included in the appendix to this report.

5.2 Average Daylight Factor

Using the analytical techniques and assumptions discussed in Sections 3 and 4, the daylighting tests have been applied for the habitable rooms within the proposed development.

In accordance with the guidance set out in both the BRE Guidelines and the BS 8206-2:2008 document, rooms that have a dual use, i.e. an open plan kitchen and lounge, are assessed as a single room and assessed against the room use with the highest daylighting requirement. For example, where a room includes both living and kitchen spaces, then the higher daylighting requirement of the kitchen is adopted as the threshold target.

The results are summarised in Table 5.1 below.

Unit number & Floor level	Room number and use	ADF value achieved	Target ADF value	Meets BRE criteria	
Lower Ground Floor	R1 – LKD	2.20%	2%	Yes	
Lower Ground Floor	R2 – Bedroom	2.18%	1%	Yes	
Ground Floor	R1 – Bedroom	3.62%	1%	Yes	
Ground Floor	R2 – LKD	4.11%	2%	Yes	

Table 5.1 – Calculated ADF values

From the results in Table 5.1 it can be seen that all rooms within the proposed development exceed the minimum required ADF target values prescribed by the BRE Guidelines. Furthermore, the results of the NSL test included in Appendix A.3. indicate that all of the rooms will enjoy excellent levels of daylight distribution.



6 Sunlight Provision to Proposed Development

6.1 Annual Probable Sunlight Hours Assessment

The BRE Guidelines provide guidance in respect of sunlight quality for new developments stating: "in housing, the main requirement for sunlight is in living rooms, where it is valued at any time of the day, but especially in the afternoon. Sunlight is also required in conservatories. It is viewed as less important in bedrooms and in kitchens where people prefer it in the morning rather than the afternoon."

The assessment criteria set out within the BRE document are discussed in Section 4.3 of this report, but in general terms the overall objective sought by the guidelines is as follows: "In general, a dwelling or non-domestic building which has a particular requirement for sunlight, will appear reasonably sunlit provided that at least one main window faces within 90 degrees of due south; and the centre of at least one window to a main living room can receive 25% of annual probable sunlight hours, including at least 5% of annual probable sunlight hours in the winter months between 21st September and 21st March".

It is also worth noting that in paragraph 3.1.11 of the BRE guidance it is suggested that if a room faces significantly north of due east or west it is unlikely to meet the recommended levels of sunlight. A further observation from paragraph 5.3 of the BS 8206-2 is that with regards to sunlight duration, the degree of satisfaction is related to the expectation of sunlight. Therefore, if a room

is north facing or if the building is in a densely-built urban area, the absence of sunlight is more acceptable than when its exclusion seems arbitrary.

It should be noted that where rooms have more than one window, it is acceptable to sum the non-coincident sunlight hours to achieve a 'room total'. This approach is acknowledged by the BRE Guidelines and facilitates a greater understanding of the sunlight received within a room by taking into account the fact that some windows will receive sunlight at different times during the day.

The results of this analysis are summarised in Table 6.1.

Floor	Room Use	Percentage APSH (Room Total)				
	Room Use	All year	Winter			
Lower Ground	R1 – LKD	55%	8%			
	R2 – Bedroom	32%	6%			
Ground	R1 – Bedroom	39%	9%			
	R2 – LKD	39%	9%			

Table 6.1 – Results of APSH Analysis

The results above show that the all of rooms exceed the aspirational target value of 25% annual probable sunlight hours and 5% winter sunlight hours. Consequently, it has been possible to conclude that the habitable rooms within the proposed development will be well lit throughout the year by direct sunlight.



7 Conclusions

The detailed analysis undertaken as part of this assessment has examined the provision of natural daylight and sunlight to the habitable rooms for the proposed development at No. 40-42 Mill Lane. Using detailed numerical modelling applications, the Average Daylight Factor (ADF) and Annual Probable Sunlight Hours (APSH) have been quantified for each room. In line with the assessment criteria prescribed by the BRE Guidelines, it has been shown that for all rooms, the provision of natural daylight will meet or exceed the minimum required threshold set out in both the BRE Guidelines. Consequently, it can be concluded that these habitable spaces will be well lit and will have a reduced reliance on supplementary electric lighting.

It has also been possible to demonstrate that in each of the proposed units, the habitable rooms will receive well in excess of the 'all year' and 'winter' target levels of direct sunlight. As a consequence of the light and additional visual interest provided by this direct sunlight, the amenity value of these rooms will be enhanced.



A Appendices

Appendix A.1 – Scheme Drawings

Appendix A.2 – Graphical Model Outputs

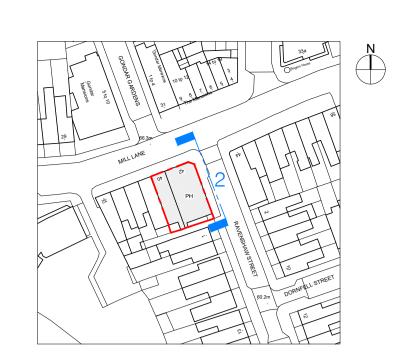
Appendix A.3 – Tabulated Results for Daylight & Sunlight Calculations (Provision to New Development)



Appendix A.1 – Scheme Drawings



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Revisions

Ko Architects

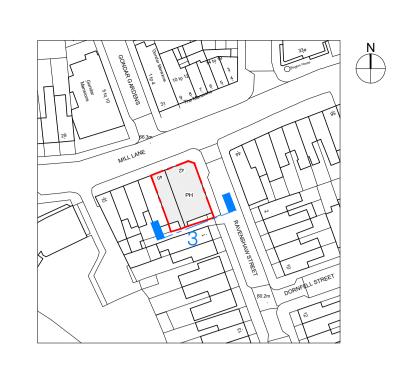
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Project: 40-42 Mill Lane, London NW6 1NR Dwg: PROPOSED ELEVATION 2 - RAVENSHAW STREET

Dwg No: 480-G11

Date: Nov 2020 Scale: 1:50@A1

Revision: _





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Client: Residall Property Limited Project: 40-42 Mill Lane, London NW6 1NR Dwg: PROPOSED REAR ELEVATION 3 AND SECTION A

Dwg No: 480-G12 Date: Nov 2020 Scale: 1:50@A1

Revision: _



Revisions

Ko Architects

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Client: Residall Property Limited

Project: 40-42 Mill Lane, London NW6 1NR

Dwg: PROPOSED GROUND FLOOR PLAN

Dwg No: 480-G13
Date: Nov 2020
Scale: 1:50@A1

Revision: __

Revisions

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Client: Residall Property Limited Project: 40-42 Mill Lane, London NW6 1NR PROPOSED LOWER GROUND FLOOR PLAN

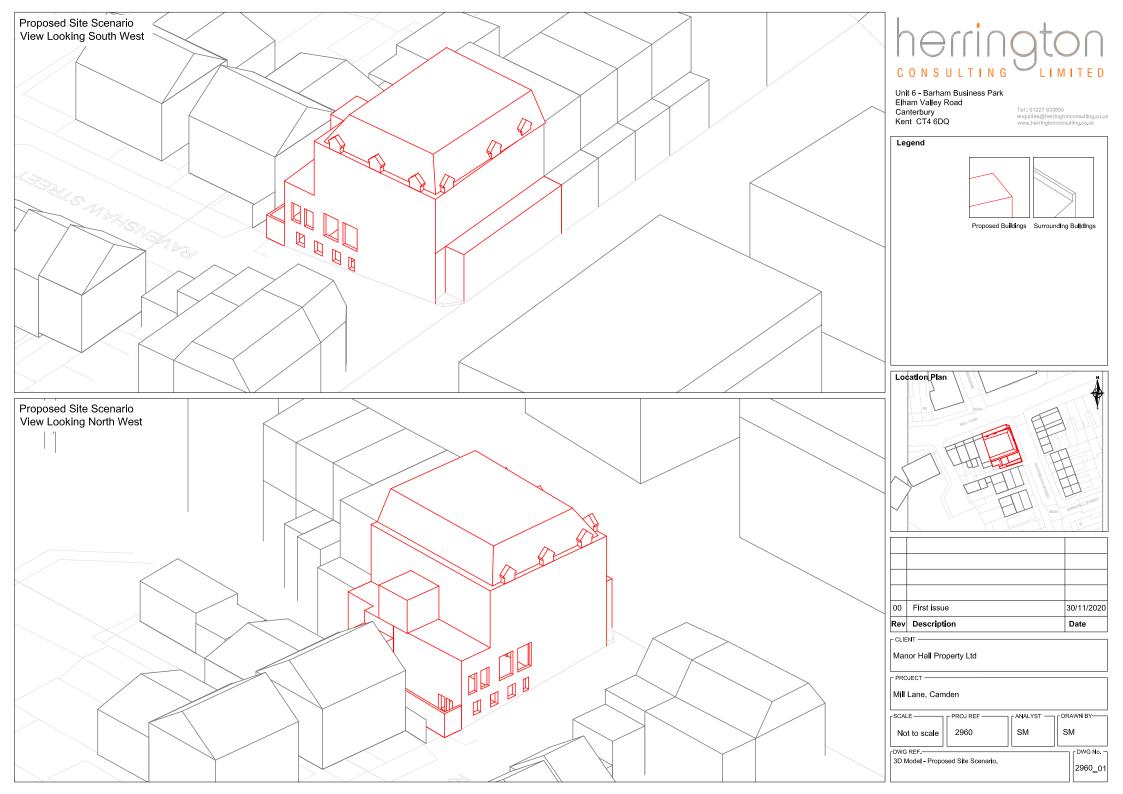
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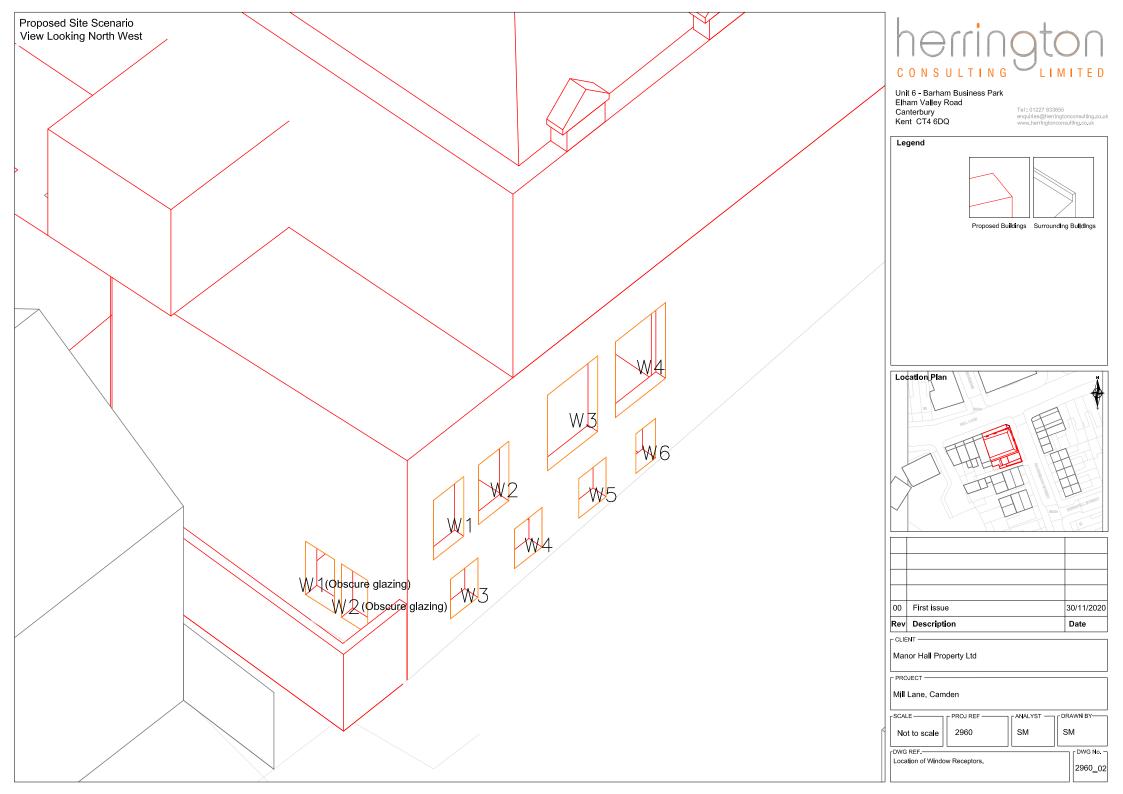
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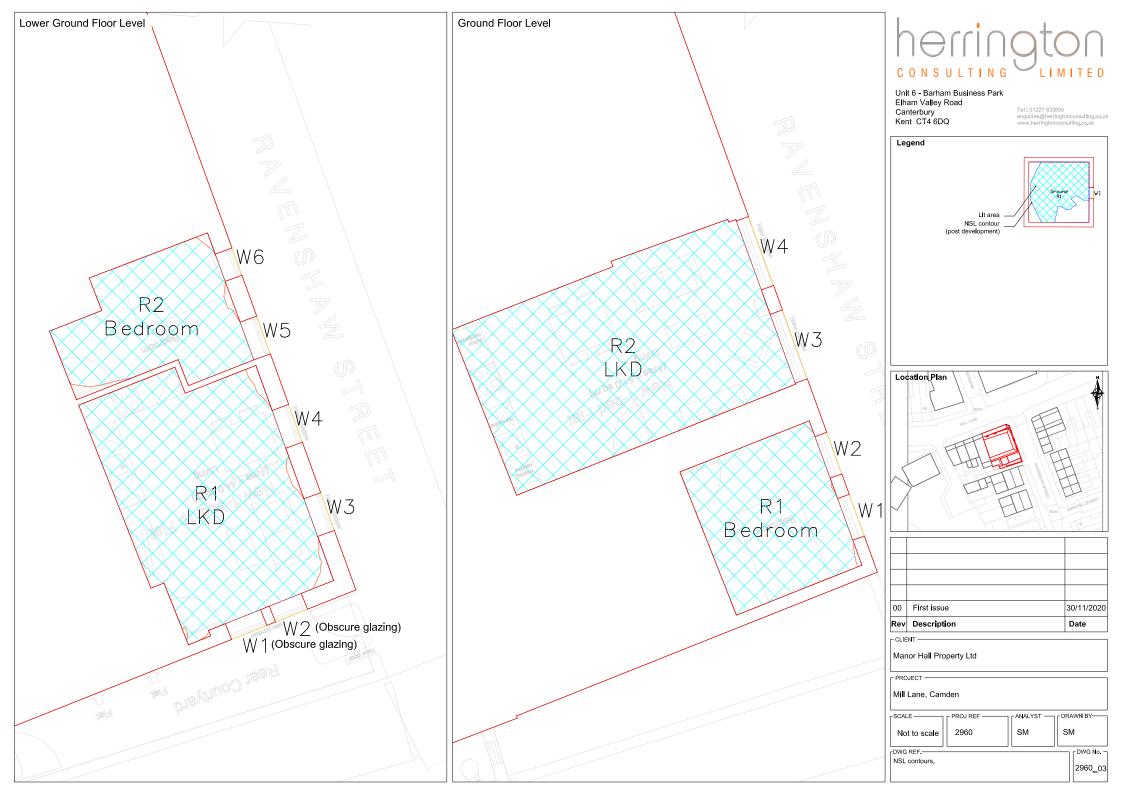
Revision: _



Appendix A.2 – Graphical Model Outputs









Appendix A.3 – Tabulated Results for Daylight and Sunlight Calculations (Provision to New Development)

Project No.: 2960 Report Title: Daylight Assessment - Proposed Scheme Test

Date: 30/11/2020



Floor Ref.	Room Ref.	Property Type	Room Use.	Window Ref.	Glass Transmittance	Maintenance Factor	Glazed Area	Clear Sky Angle Proposed	Room Surface Area	Average Surface Reflectance	Below Working Plane Factor	ADF Proposed	Req'd Value	Meets BRE Criteria
					40	-42 Mill Lane								
Lower Ground	R1	Residential	LKD	W1-L	0.35	0.92	0.10	36.34	84.19	0.65	0.15	0.00		
				W1-U	0.35	0.92	0.97	48.04	84.19	0.65	1.00	0.31		
				W2-L	0.35	0.92	0.09	35.60	84.19	0.65	0.15	0.00		
				W2-U	0.35	0.92	0.88	49.07	84.19	0.65	1.00	0.29		
				W3	0.78	0.92	0.84	64.36	84.19	0.65	1.00	0.80		
				W4	0.78	0.92	0.84	63.29	84.19	0.65	1.00	0.79		
												2.20	2.00	YES
Lower Ground	R2	Residential	Bedroom	W5	0.78	0.92	0.84	62.25	50.71	0.65	1.00	1.29		
				W6	0.78	0.92	0.61	59.52	50.71	0.65	1.00	0.89		
												2.18	1.00	YES
Ground	R1	Residential	Bedroom	W1-L	0.78	0.92	0.31	72.03	57.51	0.65	0.15	0.07		
				W1-U	0.78	0.92	1.09	73.37	57.51	0.65	1.00	1.74		
				W2-L	0.78	0.92	0.31	71.40	57.51	0.65	0.15	0.07		
				W2-U	0.78	0.92	1.09	72.89	57.51	0.65	1.00	1.73		
												3.62	1.00	YES
Ground	R2	Residential	LKD	W3-L	0.78	0.92	0.52	71.93	112.98	0.65	0.15	0.06		
				W3-U	0.78	0.92	2.41	74.96	112.98	0.65	1.00	2.00		
				W4-L	0.78	0.92	0.52	70.80	112.98	0.65	0.15	0.06		
				W4-U	0.78	0.92	2.42	74.06	112.98	0.65	1.00	1.98		
												4.11	2.00	YES

Project Name: Mill Lane, Camden

Project No.: 2960
Report Title: Sunlight Assessment - Proposed Scheme Test

Date of Analysis: 30/11/2020

APSH Analysis



Floor Ref.	Room Ref.	Property Type	Room Use.	Window Ref.	Window Orientation	Annual	Meets BRE Criteria	Winter	Meets BRE Criteria	Total Suns per Room Annual	Meets BRE Criteria	Total Suns per Room Winter	Meets BRE Criteria
					40-42	2 Mill Lane	e						
Lower Ground	R1	Residential	LKD	W1	158°	44.00	YES	3.00	NO				
				W2	158°	42.00	YES	4.00	NO				
				W3	70°N	36.00	YES	7.00	YES				
				W4	70°N	35.00	YES	7.00	YES				
										55.00	YES	8.00	YES
	R2	Residential	Bedroom	W5	70°N	32.00	YES	6.00	YES				
				W6	70°N	31.00	YES	6.00	YES				
										32.00	YES	6.00	YES
Ground	R1	Residential	Bedroom	W1	70°N	39.00	YES	9.00	YES				
				W2	70°N	39.00	YES	9.00	YES				
										39.00	YES	9.00	YES
	R2	Residential	LKD	W3	70°N	39.00	YES	9.00	YES				
				W4	70°N	38.00	YES	8.00	YES				
										39.00	YES	9.00	YES

Project Name: Mill Lane, Camden Project No.: 2960 Report Title: Daylight Assessment - Proposed Scheme Test



Date of Analysis	s: 30/11/2020)			CONSU	LTING L	IMITED
Floor Ref.	Room Ref.	Property Type	Room Use.		Room Area	Lit Area Proposed	Meets BRE Criteria
			40-42 Mill	l Lane			
Lower Ground	R1	Residential	LKD	Area m2	19.46	19.04	
				% of room		98%	YES
	R2	Residential	Bedroom	Area m2	9.00	8.71	
				% of room		97%	YES
Ground	R1	Residential	Bedroom	Area m2	9.65	9.59	
				% of room		99%	YES
	R2	Residential	LKD	Area m2	24.73	24.73	
				% of room		100%	YES