

2 Hexham Road Reading RG2 7UG

Daylight/Sunlight Report - Internal

30 January 2023

Matthew Craske

For and on behalf of Daylight Sunlight Consulting Ltd

Contents

1.	Introduction	3
2.	Executive Summary	4
3.	Principles for assessing daylight and sunlight	5
4.	Assessment Results	9
5.	Summary and conclusions	10

Appendix 1 – Illuminance Method Daylight Results

Appendix 2 – Sunlight Exposure Results

1. Introduction

- 1.1 Daylight Sunlight Consulting Ltd has been instructed to provide daylight and sunlight advice with regard to the redevelopment of 2 Hexham Road, Reading RG2 7UG, a full planning application for a day centre providing social care services (Use Class E(f)) and specialist housing (Use Class C3) with landscaping, car parking and access.
- 1.2 We have assessed the effects that the proposed development has on the light within the proposed development for the future occupants/users, focussing on the habitable rooms within the specialist housing only, as well as considering the overshadowing effects to the proposed amenity areas.
- 1.3 We have been provided with the existing and proposed drawings from Hampshire County Council drawing reference E05076 and attended site to properly understand the relationship between the development site and adjacent properties.

2. Executive Summary

- 2.1 The assessments have been undertaken in line with the Building Research Establishment (BRE) guidelines – Site Layout Planning for Daylight and Sunlight: A guide to good practice (2022).
- 2.2 The assessment of the light within the proposed development has shown that acceptable levels of daylight and sunlight will be obtained. The sun-on-ground assessments have also demonstrated the users/occupants will have access to high levels of sunlight to the proposed amenity areas.
- 2.3 We therefore conclude that the proposed redevelopment of 2 Hexham Road meets the expectations set out in the BRE guidelines, ensuring acceptable daylight and sunlight levels to the future occupants/users within the scheme.

3. Principles for assessing daylight and sunlight

3.1 The main document for testing and evaluating daylight and sunlight effects is the Building Research Establishment (BRE) guidelines – Site Layout Planning for Daylight and Sunlight: A guide to good practice (2022).

3.2 It is important to understand that the BRE document is only a guideline, and this is highlighted in the introduction: -

"The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; Its aim is to help rather than constrain the developer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of the many factors in site layout design."

3.3 The guidelines go on to highlight that,

"In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high-rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings."

Daylight to new developments

3.4 The assessment of daylight within new properties is set out in Part 2.1 of the BRE guidelines, as well as Appendix C, whereby the 2022 BRE guidelines has now been brought into line with British Standard EN 17037:2018.

3.5 The 2022 BRE guidelines sets out the methodology for the illuminance method or daylight factor method, and either test and their target levels for adherence can be used. For this report the illuminance method has been utilised, with the suggested

minimum target levels and tests summarised below, being based on a detailed 3D technical assessment model:

- 3.5.1 Illuminance Method – this measures the daylight within a room using climatic data for the location of the site, calculating the illuminance (in lux) from daylight. Adherence to the test is achieved when the following lux target levels are obtained to at least 50% of the room's space, and when 50% of the hours in the day are met:

Bedroom 100 lux

Living room 150 lux

Kitchen 200 lux

- 3.6 For both the Illuminance method and Daylight Factor methods, where there are rooms with shared uses, the highest target value should apply. However, as highlighted in the BRE guidelines, for a combined living/dining/kitchen area, if the kitchen is not treated as habitable space, which has been applied in this instance, just the living/dining area can be evaluated, although the kitchen space is included in the assessment grid area.
- 3.7 An assessment grid at 0.85m above finished floor level is created for each room, excluding a band of 0.3m from the walls. Professional judgement has been applied when creating the assessment grid in cases where there are irregular shaped spaces, rooms with corridors, annexed areas and/or fixed floor to ceiling cupboards. Where annexed areas occur, the full room layout and surfaces, including corridors are still included within the calculation model.

- 3.8 The surface reflectances for the assessment utilise the following values:

Interior Walls	– 0.7
Ceilings	- 0.8
Floors	- 0.4
Exterior walls and obstructions	- 0.4
Exterior ground	- 0.2

- 3.9 The glazing transmittance values have been utilised, with a framing factor of 0.7, as well as a maintenance factor of 0.92 applied to the double-glazing unit with a diffuse transmittance value of 0.68.

Sunlight to new developments

- 3.10 The assessment of sunlight for new developments is set out in Part 3.1 of the BRE guidelines, stating: -

"In housing, the main requirement for sunlight is in living rooms, where it is valued at any time of day but especially in the afternoon. Sunlight is also required in conservatories. It is viewed less important in bedrooms and in kitchens, where people prefer it in the morning rather than the afternoon."

- 3.11 The opportunity to design for sunlight to residential properties is very dependent on orientation and site layout. As highlighted in the introduction of the BRE guidelines, the advice is not mandatory and should not be seen as an instrument of planning policy. This is particularly relevant for sunlight design, as a building's location, height and orientation should be guided more by town planning considerations and aesthetics. The adherence rates for more denser residential design are going to be lower than for more suburban houses.
- 3.12 For interiors, access to sunlight utilises the British Standard EN 17037 assessment methodology, with the target criteria of 1.5 hours of direct sunlight on the assessment date of 21 March. For dwellings, it is recommended that at least one habitable room, preferably the main living room, should meet the criterion.
- 3.13 A detailed 3D technical assessment CAD model has been created, inputting the rooms, walls, window reveals and external obstructions to replicate the potential built out scheme. The bespoke computer software assesses each window, taking the inside centre of the window, and where multiple windows light a room, the

cumulative sunlight availability is added together, ensuring there is no double counting of the same sunlight hours.

Sunlight to new amenity areas

3.14 The assessment of sunlight for amenity areas, such as gardens and open spaces adjacent to a development site are set out in Part 3.3 of the BRE guidelines. A sensitive receptor is considered a garden (generally the more private back garden area), parks, playing fields, playgrounds, outdoor swimming/paddling pools and public open spaces used for sitting/key focal points.

3.15 The assessment considers the amount of sunlight an amenity area can achieve on 21 March, as this represents the mid-point between the height of summer and depths of winter. The BRE guidelines state at paragraph 3.3.17,

“It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March.”

3.16 The BRE guidelines go on to highlight that fences lower than 1.5m do not need to be included as an obstruction in the assessment model, and sunlight at an altitude of 10° is also excluded. In addition, when working out the total amenity area to be considered, driveways and hard standing for cars should be left out. Around housing, front gardens that are relatively small and visible from public footpaths should be omitted; only the main back garden should be analysed.

4. Assessment Results

- 4.1 Having constructed the 3D CAD model and applied the appropriate surface finishes, the assessments have been run using MBS Software with the illuminance results shown at Appendix 1 of this report and sunlight exposure results at Appendix 2. The ground and first floor levels have been tested in detail, as these are the areas where daylight and sunlight levels are at their lowest. It will be the case that the upper floor levels will obtain even higher levels of daylight and sunlight than those highlighted below. The following summary of the results is as follows:
- 4.1.1 The daylight assessment utilising the Illuminance Method shows that 41 (98%) of the 42 rooms tested achieve the target lux levels to 50% of the room's assessment area. The one room falling below the suggested target is a living room on the ground floor, which obtains a value of 41%, which is not far off the 50% target area. It is considered that 98% adherence is very good for a development such as this, providing acceptable daylight levels to the occupants.
- 4.1.2 The sunlight assessment shows 21 (50%) of the 42 rooms tested will meet or exceed the target of 1.5 hours of sunlight on the assessment date of 21 March. This level of adherence is consistent with a development that has windows on all four aspects, and thus considered acceptable.
- 4.2 The sun-on-ground assessment has been undertaken for the external amenity areas provided within the scheme at the ground and first floor level, as these are the floor levels that will have the lowest sunlight availability. The results show all 4 amenity areas tested exceed the BRE guidelines target of 2-hours of sunlight to over 50% of the amenity area. Therefore, the amenity areas on the floor levels above will obtain even higher levels of adherence. The sun-on-ground results can be found on plan at Appendix 1, with the tabled results at Appendix 2.

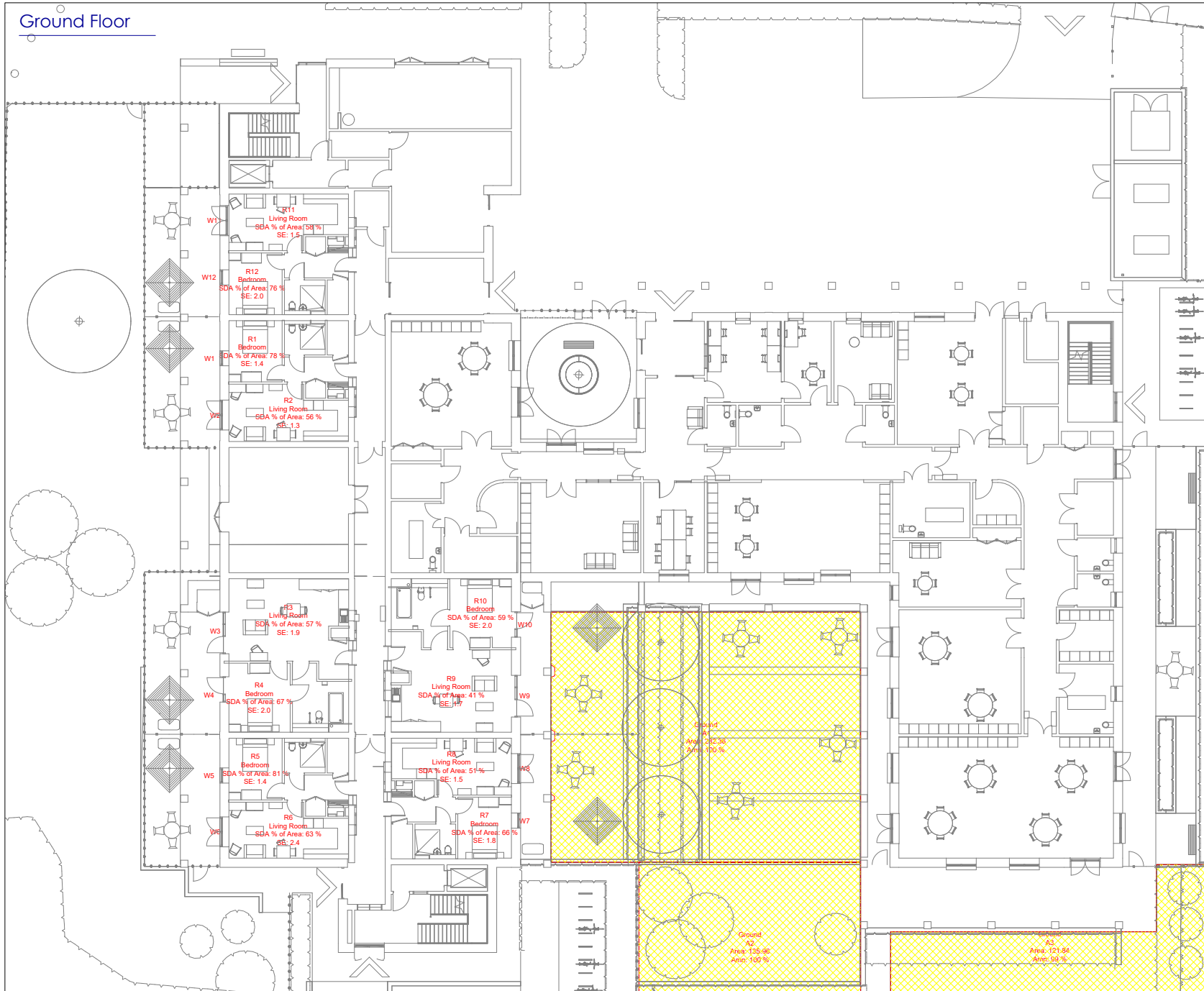
5. Summary and conclusions

- 5.1 The assessments have been undertaken in line with the Building Research Establishment (BRE) guidelines – Site Layout Planning for Daylight and Sunlight: A guide to good practice (2022).
- 5.2 The assessment of the light within the proposed development has shown that acceptable levels of daylight and sunlight will be obtained. The daylight assessment shows 41 (98%) of the 42 rooms tested achieve the target lux levels to 50% of the room's assessment area. The one room falling below the suggested target is a living room on the ground floor, which obtains a value of 41%, which is not far off the 50% target area. The sunlight assessment shows 50% of the rooms tested adhere to the BRE guidelines, which is consistent with a design that utilises all four aspects. The sun-on-ground assessment shows 100% of the amenity areas will meet or exceed the BRE guidelines, ensuring occupants have access to high levels of sunlight throughout the year.
- 5.3 We therefore conclude that the proposed redevelopment of 2 Hexham Road meets the expectations set out in the BRE guidelines, ensuring acceptable daylight and sunlight levels to the future occupants/users within the scheme.

Appendix 1

Illuminance Method Daylight Results

Ground Floor



NOTES:
No dimensions are to be scaled from this drawing.
All dimensions are to be checked on site, where
discrepancy occurs between specification and
drawings the supervising officer must be notified.

REV	NOTES	DRAWN	DATE



St Mary's Court
The Broadway
Old Amersham
Buckinghamshire
HP7 0UT
Tel: 07943 182 548
www.dsconsult.co.uk

CLIENT:
Hampshire County Council

PROJECT:
Hexham Road
Reading
RG2 7UQ

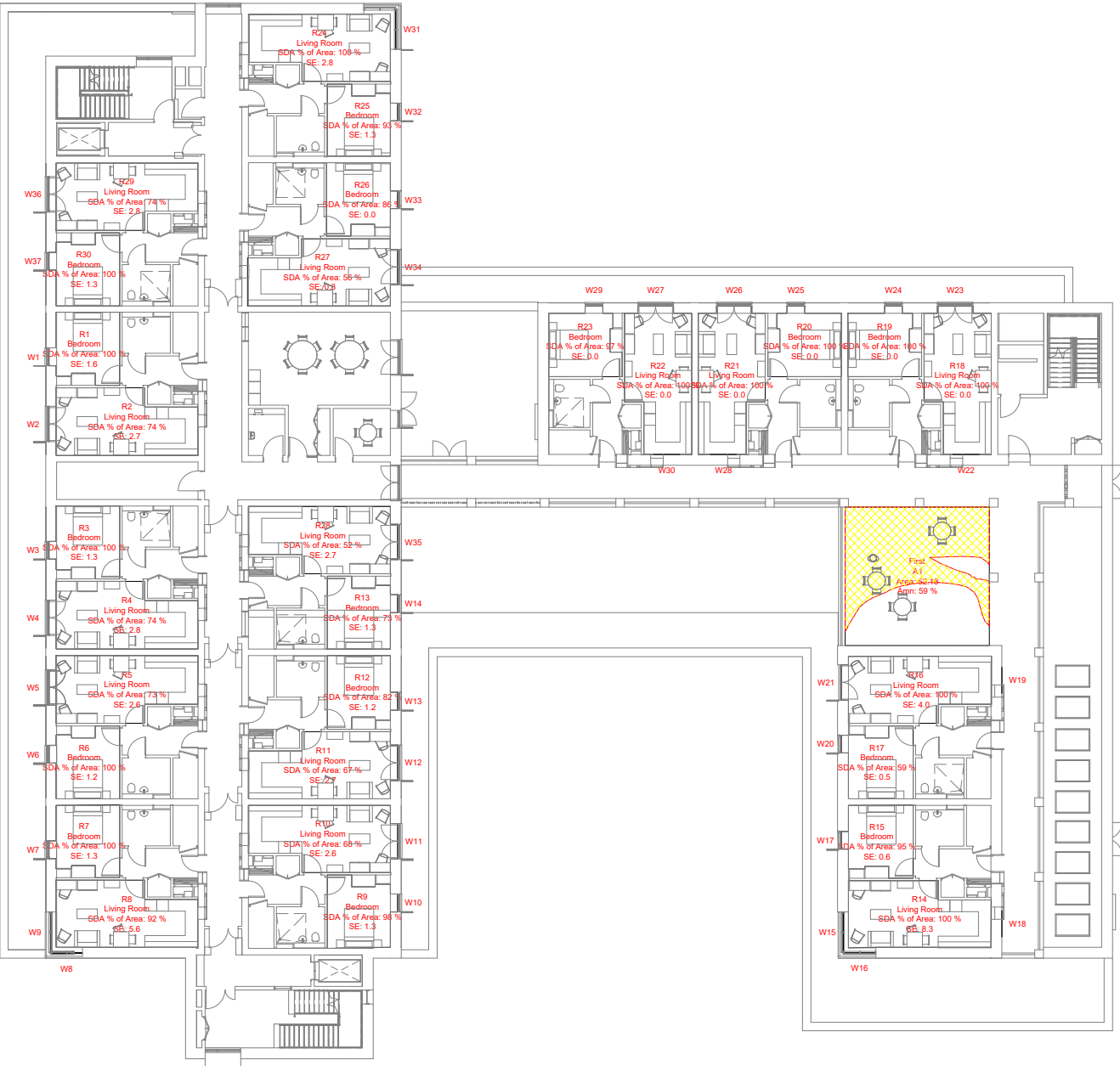
DRAWING TITLE:
Illuminance Method results

SCALE @ A1: NTS	DATE: Jan 23	DRAWN: MC	CHECKED:
--------------------	-----------------	--------------	----------

DRAWING NUMBER: HR-02-01	REV: .
-----------------------------	-----------



First Floor



NOTES:
No dimensions are to be scaled from this drawing.
All dimensions are to be checked on site, where
discrepancy occurs between specification and
drawings the supervising officer must be notified.

REV	NOTES	DRAWN	DATE



St Mary's Court
The Broadway
Old Amersham
Buckinghamshire
HP7 0UT
Tel: 07943 182 548
www.dsconsult.co.uk

CLIENT:
Hampshire County Council

PROJECT:
Hexham Road
Reading
RG2 7UQ

DRAWING TITLE:
Illuminance Method results

SCALE @ A1: NTS	DATE: Jan 23	DRAWN: MC
CHECKED:		

DRAWING NUMBER: HR-02-02	REV: .
-----------------------------	-----------



Project Name: Hexham Road
Project No.: 2
Report Title: SDA BS En17037 Analysis - Proposed Scheme
Date of Analysis: 04/01/2023

								Criteria			
Floor Ref	Room Ref	Room Use	Room Area m2	Effective Area	Median Lux	Area Meeting Req Lux	% of Area Meeting Req Lux	Req Lux	Req % of Effective Area	Req % of Daylight Hours	Daylight Hours
Ground	R1	Bedroom	12.33	8.31	148	6.45	78%	100	50%	50%	4380
	R2	Living Room	22.45	16.38	160	9.10	56%	150	50%	50%	4380
	R3	Living Room	31.63	24.65	162	14.07	57%	150	50%	50%	4380
	R4	Bedroom	13.50	9.12	113	6.09	67%	100	50%	50%	4380
	R5	Bedroom	12.12	8.29	143	6.70	81%	100	50%	50%	4380
	R6	Living Room	21.90	15.88	181	10.04	63%	150	50%	50%	4380
	R7	Bedroom	10.90	6.99	124	4.61	66%	100	50%	50%	4380
	R8	Living Room	20.88	14.85	144	7.54	51%	150	50%	50%	4380
	R9	Living Room	28.79	21.82	126	8.96	41%	150	50%	50%	4380
	R10	Bedroom	14.64	9.89	108	5.86	59%	100	50%	50%	4380
	R11	Living Room	22.16	16.12	165	9.33	58%	150	50%	50%	4380
	R12	Bedroom	12.44	8.39	147	6.41	76%	100	50%	50%	4380
First	R1	Bedroom	11.34	7.20	189	7.20	100%	100	50%	50%	4380
	R2	Living Room	22.44	16.37	230	12.04	74%	150	50%	50%	4380
	R3	Bedroom	11.34	7.20	186	7.18	100%	100	50%	50%	4380
	R4	Living Room	22.44	16.37	229	12.04	74%	150	50%	50%	4380
	R5	Living Room	22.44	16.37	237	11.93	73%	150	50%	50%	4380
	R6	Bedroom	11.34	7.20	192	7.20	100%	100	50%	50%	4380
	R7	Bedroom	11.30	7.16	188	7.16	100%	100	50%	50%	4380
	R8	Living Room	22.21	16.16	332	14.92	92%	150	50%	50%	4380
	R9	Bedroom	11.27	7.14	169	6.99	98%	100	50%	50%	4380
	R10	Living Room	22.89	16.61	214	11.31	68%	150	50%	50%	4380
	R11	Living Room	22.89	16.61	211	11.13	67%	150	50%	50%	4380
	R12	Bedroom	11.36	7.22	147	5.91	82%	100	50%	50%	4380
	R13	Bedroom	11.27	7.14	150	5.22	73%	100	50%	50%	4380
	R14	Living Room	22.22	16.15	521	16.15	100%	150	50%	50%	4380
	R15	Bedroom	11.51	7.34	149	6.94	95%	100	50%	50%	4380
	R16	Living Room	23.07	16.76	270	16.76	100%	150	50%	50%	4380
	R17	Bedroom	11.54	7.36	108	4.32	59%	100	50%	50%	4380
	R18	Living Room	22.76	16.51	301	16.51	100%	150	50%	50%	4380
	R19	Bedroom	11.39	7.24	181	7.21	100%	100	50%	50%	4380
	R20	Bedroom	11.39	7.24	181	7.21	100%	100	50%	50%	4380

Project Name: Hexham Road
Project No.: 2
Report Title: SDA BS En17037 Analysis - Proposed Scheme
Date of Analysis: 04/01/2023

								Criteria			
Floor Ref	Room Ref	Room Use	Room Area m2	Effective Area	Median Lux	Area Meeting Req Lux	% of Area Meeting Req Lux	Req Lux	Req % of Effective Area	Req % of Daylight Hours	Daylight Hours
	R21	Living Room	22.76	16.51	326	16.51	100%	150	50%	50%	4380
	R22	Living Room	22.76	16.51	317	16.51	100%	150	50%	50%	4380
	R23	Bedroom	11.35	7.20	172	6.96	97%	100	50%	50%	4380
	R24	Living Room	22.19	16.15	469	16.15	100%	150	50%	50%	4380
	R25	Bedroom	11.14	7.04	167	6.56	93%	100	50%	50%	4380
	R26	Bedroom	11.49	7.32	155	6.26	86%	100	50%	50%	4380
	R27	Living Room	23.02	16.72	164	9.32	56%	150	50%	50%	4380
	R28	Living Room	22.89	16.61	156	8.69	52%	150	50%	50%	4380
	R29	Living Room	22.26	16.21	241	11.93	74%	150	50%	50%	4380
	R30	Bedroom	11.34	7.20	191	7.18	100%	100	50%	50%	4380

Appendix 2

Sunlight Exposure Results

Project Name: Hexham Road Project No.: 2 Report Title: Sunlight Exposure Analysis - Proposed Scheme Date: 04/01/2023				
Floor Ref	Room Ref	Room Use	Window Ref	Proposed Sunlight Exposure (Hours)
Ground	R1	Bedroom	W1	1.4
				1.4
Ground	R2	Living Room	W2	1.3
				1.3
Ground	R3	Living Room	W3	1.9
				1.9
Ground	R4	Bedroom	W4	2
				2
Ground	R5	Bedroom	W5	1.4
				1.4
Ground	R6	Living Room	W6	2.4
				2.4
Ground	R7	Bedroom	W7	1.8
				1.8
Ground	R8	Living Room	W8	1.5
				1.5
Ground	R9	Living Room	W9	1.7
				1.7
Ground	R10	Bedroom	W10	2
				2
Ground	R11	Living Room	W11	1.5
				1.5
Ground	R12	Bedroom	W12	2
				2
First	R1	Bedroom	W1	1.6
				1.6
First	R2	Living Room	W2	2.7
				2.7
First	R3	Bedroom	W3	1.3
				1.3
First	R4	Living Room	W4	2.8
				2.8
First	R5	Living Room	W5	2.6
				2.6
First	R6	Bedroom	W6	1.2
				1.2
First	R7	Bedroom	W7	1.3
				1.3
First	R8	Living Room	W8	1.9
			W9	4.4
				5.6
First	R9	Bedroom	W10	1.3
				1.3
First	R10	Living Room	W11	2.6
				2.6
First	R11	Living Room	W12	2.7
				2.7
First	R12	Bedroom	W13	1.2
				1.2
First	R13	Bedroom	W14	1.3
				1.3

Project Name: Hexham Road
Project No.: 2
Report Title: Sunlight Exposure Analysis - Proposed Scheme
Date: 04/01/2023

Floor Ref	Room Ref	Room Use	Window Ref	Proposed Sunlight Exposure (Hours)
First	R14	Living Room	W15	4.3
			W16	1.9
			W18	3.7
				8.3
First	R15	Bedroom	W17	0.6
				0.6
First	R16	Living Room	W19	2.2
			W21	1.8
				4
First	R17	Bedroom	W20	0.5
				0.5
First	R18	Living Room	W22	0
			W23	0
				0
First	R19	Bedroom	W24	0
				0
First	R20	Bedroom	W25	0
				0
First	R21	Living Room	W26	0
			W28	0
				0
First	R22	Living Room	W27	0
			W30	0
				0
First	R23	Bedroom	W29	0
				0
First	R24	Living Room	W31	2.8
				2.8
First	R25	Bedroom	W32	1.3
				1.3
First	R26	Bedroom	W33	0
				0
First	R27	Living Room	W34	0.3
				0.3
First	R28	Living Room	W35	2.7
				2.7
First	R29	Living Room	W36	2.8
				2.8
First	R30	Bedroom	W37	1.3
				1.3

Project Name: Hexham Road
 Project No.: 2
 Report Title: Two hours Sunlight to Amenity Analysis - Proposed Scheme
 Date of Analysis: 04/01/2023

Floor Ref	Amenity Ref	Amenity Area	Lit Area Proposed	Meets BRE Criteria
Ground	A1	282.36	282.01 100%	YES
Ground	A2	135.96	135.96 100%	YES
Ground	A3	121.84	121.21 99%	YES
First	A1	52.18	30.56 59%	YES



Contact Daylight Sunlight Consulting Ltd

www.dsconsult.co.uk
info@dsconsult.co.uk
07943182548