SUPPLEMENTARY DAYLIGHT & SUNLIGHT REPORT

relating to the

PROPOSED DEVELOPMENT

at

19-37 HIGHGATE ROAD
LONDON NW5

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APPENDICES

1.0 EXECUTIVE SUMMARY STATEMENT

1.1 This Daylight & Sunlight Supplementary Report considers the contents and findings of the previous Schroeders Begg Daylight & Sunlight Report (dated March 2022 ref. 2096/H rev 04), in view of the subsequent newly revised BRE Guide 3rd edition which was released on 8th June 2022.

1.2 The new BRE Guide 3rd edition was prior to the analysis and preparation of the Schroeders Begg Daylight & Sunlight Report (dated March 2022 ref. 2096/H rev 04). Notwithstanding this subsequent release of the new BRE Guide post completion of the March 2022 report, we have been requested to comment upon how the analysis and findings would now differ given the new BRE Guide 3rd edition, which we comment upon as follows;

Neighbouring review

1.3 In terms of impact upon daylight and sunlight to neighbouring properties, the methodology of the various applicable review tests for both daylight and sunlight, effectively remains the same within the BRE Guide 3rd edition (2022) to that of the former 2nd edition (2011). Therefore, no update is required to the analysis submitted for neighbouring review within the Schroeders Begg Daylight & Sunlight Report (dated March 2022). As further background, for non-domestic buildings, the new BRE Guide 3rd edition continues to clarify that analysis would only be sought *'where the occupants of such buildings have a reasonable expectation of daylight'*; from our experience, ordinarily, offices or similar are not reviewed but schools and similar would be applicable for review. On this basis, we do not consider it applicable to review any other neighbouring properties to that previously reviewed and already reported upon and nor do we consider any neighbouring review is applicable for updating.

1.4 We note that comment has been made that the consented VSC and sunlight hours analysis is not exactly matching former reports (e.g. Schroeders Begg report dated August 2013 versus March 2022). There are a number of reasons for this but in particular, we highlight;

a) The 2013 report analysis was undertaken almost 10 years ago. Since that date, there have been numerous software updates which have advanced daylight and sunlight review and with each software update, there is often some refinement in analysis output. In particular, in comparing earlier software releases to that of more recent software releases, for sunlight, larger differentials in analysis can occur.

b) The accuracy of modelling has changed. The existing model back in 2013 was derived primarily from photogrammetry, OS and photography at that time. The existing model utilised for the 2022 review was primarily derived from a much more accurate 3D terrestrial laser scan.

1.5 Thus, it is evitable that some limited degree of variation would result in terms of seeking to compare analysis review utilising 2013 software and modelling with that of modern advances now available nearly 10 years later.

1.6 The most accurate analysis is as presented within the March 2022 report (including re-calculation of the 2013 consented scheme in reference to latest context modelling and software). As background, it is important to highlight that whilst, as stated, some limited variance will result from comparing existing or proposed analysis values, computed in 2013 to that of 2022, in terms of the actual shift change, (from existing to proposed values), whether 2013 or 2022 modelling or software), closer correlation is anticipated since whichever analysis and model and software release is utilised, both existing and proposed values will be subjected to the same limitations within that model and software at that time.

1.7 For any comparison with the analysis data produced within the 2016 scheme daylight and sunlight report, we are unable to comment as such input was undertaken by a different consultant. However, for scheme comparison reviews undertaken by Schroeders Begg, with both the 2013 and 2016 respective schemes, to confirm, such comparison has been analysed, all within the latest modelling context and software thus on a like for like basis and thereby allowing applicable comparison between the impacts of respective schemes.

Self-test review

1.8 Whilst the most up-to-date and relevant BRE Guide edition was utilised at the time of analysis review and report preparation (Schroeders Begg report dated March 2022), we are responding to a request by the LPA that we update the analysis in respect of the newly released BRE Guide 3rd edition, notwithstanding that this was released over two months after completing of the March 2022 report.

1.9 However, for self-test review, we do recognise that the methodology has now significantly changed to that previously utilised and relevant at the time of the March 2022 report.

1.10 Inevitably, in seeking to retrospectively review a scheme against new criterion that was not applicable at the time of scheme design, some greater flexibility should be allowed on the interpretation of such results; it is unrealistic for a pre-designed scheme to satisfy all new targets which were not known about or tested at the time of scheme finalisation for planning. However, as requested, we are pleased to present the self-test review in terms of provision of daylight and sunlight within the scheme in reference to the new BRE Guide 3rd edition (2022) within section 2.0 of this report.

1.11 In reference to section 2.0 of this report, for review of the provision of daylight and sunlight within the scheme with analysis consideration to the new BRE Guide 3rd edition (2022), notwithstanding that such revised target criteria was introduced post design of the scheme planning proposals, even in consideration of such subsequent criteria, the scheme is considered to be performing well with almost all rooms / dwellings as applicable, meeting the new BRE Guide target criteria and where there are isolated departures, these are very limited and still relatively close to target overall.

1.12 On this basis, our conclusion remains the same as per Schroeders Begg March 2022 report in that '*In summary, reasonable daylight and sunlight levels are provisioned for within this new development application proposal for the given urban context'.*

2.0 SELF-TEST REVIEW

Introduction

2.1 We have been requested to undertake a self-test review of the provision of daylight and sunlight within the proposal in reference to the new BRE Guide 3rd edition (2022) which was released on 8th June 2022 (notwithstanding that review had already been completed as per the Schroeders Begg Daylight & Sunlight Report dated March 2022 ref. 2096/H rev 04, in reference to the BRE Guide 2nd edition (2011), which was the relevant BRE Guide at the time of review.

2.2 The new BRE Guide 3rd edition (2022) sets completely new methodology for the self-test review of daylight and sunlight within the proposal and we examine the criteria and analysis output as follows;

Daylight Provision within the proposal

2.3 We have followed the methodology within the new BRE Guide 3rd edition (2022), the main applicable section within the BRE Guide being 'Appendix C: Interior daylight recommendations.'

2.4 The former average daylight factor (ADF) review, is no longer applicable and the new methodology can follow either the 'Illuminance method' (which involves using climatic data for the location of the site to calculate the illuminance from daylight (within the room on the assessment grid / working plane at hourly intervals for a typical year) OR the 'Daylight Factor method' (which utilises a CIE standard overcast sky and expresses the ratio as a percentage of a point on the working plane within the room, divided by the illuminance on an unobstructed horizontal surface outdoors).

2.5 The BRE Guide highlights the specific recommendations for daylight provision in UK dwellings derived from a UK National Annex which gives specific minimum recommendations for habitable rooms in dwellings in the United Kingdom. Whilst the application of these values are flagged as *'hard to light'* dwellings, reference is stated to include *'significant external obstruction'*; there is currently no guidance as to what amounts to *'significant external obstruction'* but a reasonably dense urban context within London could be considered applicable. The minimum recommendations are stated in para. C16 of the BRE Guide as;

'C16: The UK National Annex gives illuminance recommendations of 100 lux in bedrooms, 150 lux in living rooms and 200 lux in kitchens. These are median illuminances, to be exceeded over at least 50% of the assessment points in the room for at least half of the daylight hours. The recommended levels over 95% of a reference plane need not apply to dwellings in the UK.'

2.6 In terms of inputting data, for comparison and continuity, we have utilised, were applicable, the same inputting data previously utilised in terms of glazing transmission, framing factor, maintenance factor and surface reflectances. Also as previously, we have analysed the three lowest floors of residential as typically, the most demanding of rooms to achieve target (the higher up within the proposal, with all other factors remaining equal, analysis results will improve with correspondingly less obstruction).

2.7 We have utilised the 'Illuminance method' for review and the output of analysis is presented within **Table 1 – Self-test – Daylight SDA** (Spatial Daylight Autonomy) and visually presented within plot **Drawing No. 1002**, all within **Appendix 1**.

2.8 From **Table 1**, the analysis results of all habitable rooms at ground, 1st and 2nd floor (lowest 3 No. floors), confirms that 91% (52 No. out of 57 No. habitable rooms), readily meet the illuminance target for daylighting thus representing a good pass rate, even though this criteria post-dated the design and accordingly, not designed to such target criteria. For the isolated 5 No. habitable rooms not meeting this latest target, it can be seen that they still achieve a reasonable amount of daylighting provision. It is also noted that there is only one room at 2nd floor not meeting target, though to highlight, it is still very close to meeting target and we anticipate that habitable rooms above, should all meet target criteria.

Sunlight Provision within the proposal

2.9 We have followed the methodology within the new BRE Guide 3rd edition (2022) with the main applicable section within the BRE Guide being section *'3. Sunlighting – 3.1 New Development.'*

2.10 The former review of Annual Probable Sunlight Hours (APSH) and winter hours, is no longer applicable for self-test review and the new methodology recommendations are primarily stated in para. 3.1.10 of the BRE Guide as;

'3.1.10: For interiors, access to sunlight can be quantified. BS EN 17037 recommends that a space should receive a minimum of 1.5 hours of direct sunlight on a selected date between 1 February and 21 March with cloudless conditions. It is suggested that

21 March (equinox) be used. The medium level of recommendation is three hours and the high level of recommendation four hours. For dwellings, at least one habitable room, preferably a main living room, should meet at least the minimum criterion…'

2.11 In terms of inputting data, we have selected the 21st March (equinox) review date as suggested by the BRE Guide and as previously, we have analysed the 3 lowest floors of residential as typically, the most demanding of rooms to achieve target (the higher up within the proposal, with all other factors remaining equal, analysis results will improve with correspondingly less obstruction).

2.12 The output of analysis is presented within **Table 2 – Self-test – Sunlight Exposure** within **Appendix 2**.

2.13 From **Table 2**, the analysis results of all habitable rooms at ground, 1st and 2nd floor (lowest 3 No. floors), confirms that 91% (21 No. out of 23 No. dwellings at ground, 1st & 2nd floor), would have at least one habitable room with the ability to receive 1.5 hours or more of sunlight at 21st March, thus meeting the new BRE Guide target (and to highlight, the majority of instances, are as preferred to living rooms).

2.14 In respect of the 2 No. isolated dwellings not meeting target, given that each would have a bedroom that has the ability to receive 1.3 hours of sunlight at 21st March (equinox), we consider this still reasonable close to the new target of 1.5 hours.

2.15 We conclude that for sunlight provision, this represents a good level of achieving target even though this criterion post-dated the design and accordingly, not designed to such new target criteria. We also highlight that given the site orientation, the front elevation which faces onto Highgate Road is north-east facing thus some inherent restriction to sunlight and so the fact that the scheme is still achieving good provision in respect of the new BRE Guide target is even more encouraging.

Conclusion on Self-test of Daylight and Sunlight (re. new BRE Guide)

2.16 In reference to the consideration of provision of daylight and sunlight within the scheme utilising the methodology within the new BRE Guide 3rd edition (2022), notwithstanding that such revised target criteria was introduced post design of the scheme planning proposals, even in consideration of such subsequent criteria, the scheme is considered to be performing well with almost all rooms / dwellings as applicable, meeting the new BRE Guide target criteria and where there are isolated departures, these are very limited and still typically close to target overall.

2.17 On this basis, we consider the provision of daylight and sunlight within the scheme should still be considered reasonable and in terms of sunlight, especially given the context orientation of the site. It is also important to note that the new BRE Guide 3rd edition (2022) still remains a guide and it is still stated within the new BRE Guide that *'although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design'* (part extract form para. 1.6 of the new BRE Guide).

2.18 In summary, our conclusion remains the same as per Schroeders Begg March 2022 report in that;

3.1 'In terms of sunlight provision, we can consider that given the linear nature and alignment of site, the scheme can be considered as having a reasonable availability of sunlight commensurate for an urban locality within this multi-unit development / considered similar to the PCKO 2013 scheme.'

3.2 'In summary, reasonable daylight and sunlight levels are provisioned for within this new development application proposal for the given urban context.'

APPENDICES

1. SELF-TEST REVIEW OF DAYLIGHT

Table 1 – Self-test – Daylight SDA (Spatial Daylight Autonomy)
Drawing No. 1002 – Visual plot for Daylight SDA

2. SELF-TEST REVIEW OF SUNLIGHT

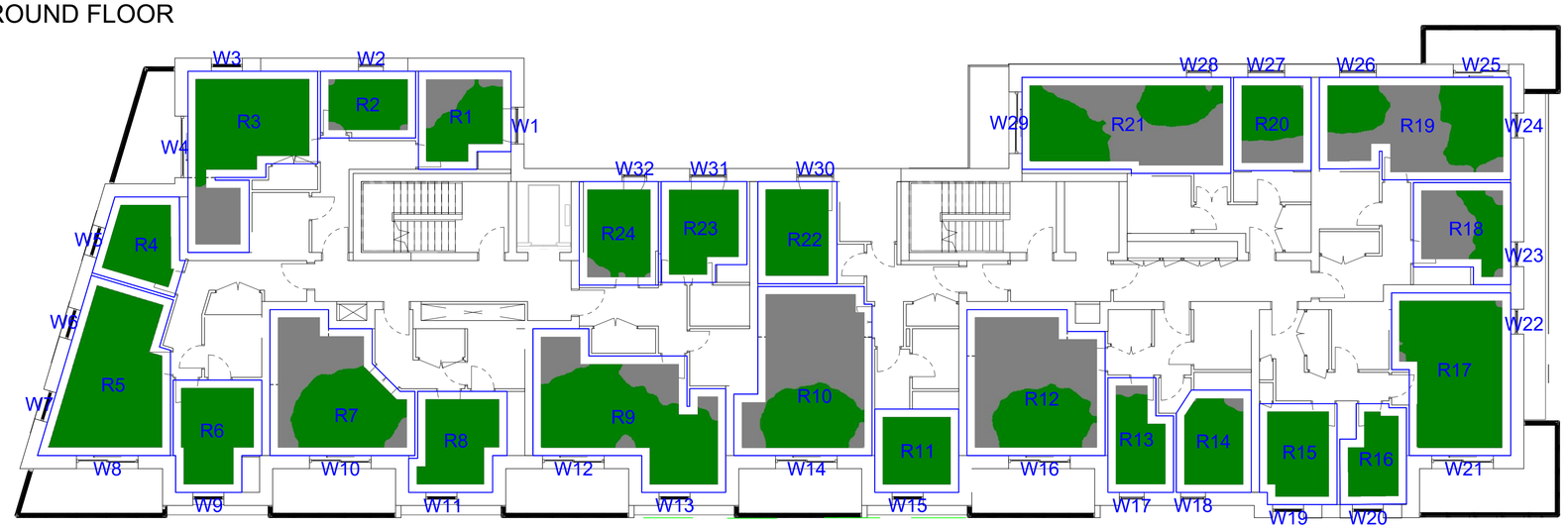
Table 2 – Self-test – Sunlight Exposure

Appendix 1 - Self-test review of Daylight

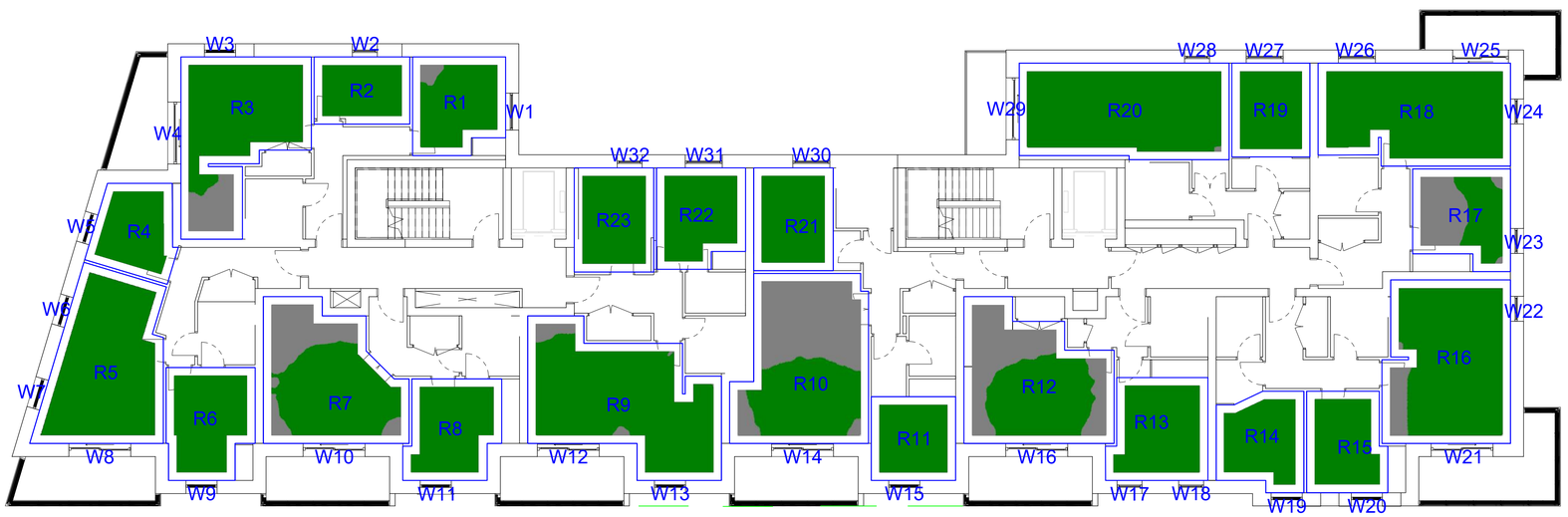
Table 1 – Self-test – Daylight SDA (Spatial Daylight Autonomy)
Drawing No. 1002 – Visual plot for Daylight SDA

Table 1 - Self-test - Daylight SDA									
Floor Ref	Room Ref	Flat Ref.	Room Use	Room Area m2	Effective Area	Area Meeting Req Lux	% of Area Meeting Req Lux	Req Lux	Meets Criteria
Proposed Residential Units									
Ground	R1	FLAT 0A	Living Room	35.03	26.74	14.51	54%	150	YES
	R2	FLAT 0A	Bedroom	13.22	9.11	8.92	98%	100	YES
	R3	FLAT 0B	Living Room	22.84	16.85	16.64	99%	150	YES
	R4	FLAT 0B	Bedroom	10.76	7.20	7.20	100%	100	YES
	R5	FLAT 0C	Living Room	22.96	16.33	10.70	66%	150	YES
	R6	FLAT 0C	Bedroom	12.89	8.84	8.84	100%	100	YES
	R7	FLAT 0D	Living Room	32.32	25.47	10.09	40%	150	BELOW
	R8	FLAT 0D	Bedroom	15.57	10.89	10.89	100%	100	YES
	R9	FLAT 0E	Living Room	29.24	22.79	11.97	53%	150	YES
	R10	FLAT 0E	Bedroom	14.61	10.27	10.11	98%	100	YES
First	R1	FLAT 1A	Bedroom	11.43	7.59	5.40	71%	100	YES
	R2	FLAT 1A	Bedroom	8.56	5.36	5.05	94%	100	YES
	R3	FLAT 1A	Living Room	23.68	16.44	13.07	79%	150	YES
	R4	FLAT 1B	Bedroom	9.31	5.97	5.97	100%	100	YES
	R5	FLAT 1B	Living Room	24.19	18.25	18.25	100%	150	YES
	R6	FLAT 1B	Bedroom	12.28	8.22	8.22	100%	100	YES
	R7	FLAT 1C	Living Room	23.18	17.33	9.59	55%	150	YES
	R8	FLAT 1C	Bedroom	11.85	7.82	7.82	100%	100	YES
	R9	FLAT 1D	Living Room	30.28	22.40	17.15	77%	150	YES
	R23	FLAT 1D	Bedroom	10.91	7.16	7.16	100%	100	YES
	R24	FLAT 1D	Bedroom	11.02	7.36	6.86	93%	100	YES
	R10	FLAT 1E	Living Room	27.79	21.39	7.21	34%	150	BELOW
	R11	FLAT 1E	Bedroom	9.41	6.09	6.09	100%	100	YES
	R22	FLAT 1E	Bedroom	10.88	7.25	7.25	100%	100	YES
	R12	FLAT 1F	Living Room	26.04	20.14	6.99	35%	150	BELOW
	R13	FLAT 1F	Bedroom	9.22	5.62	5.21	93%	100	YES
	R14	FLAT 1F	Bedroom	10.09	6.65	6.38	96%	100	YES
	R15	FLAT 1G	Bedroom	10.43	6.86	6.86	100%	100	YES
	R16	FLAT 1G	Bedroom	8.14	4.82	4.82	100%	100	YES
	R17	FLAT 1G	Living Room	24.05	18.20	17.98	99%	150	YES
	R18	FLAT 1H	Bedroom	11.96	7.93	3.03	38%	100	BELOW
	R19	FLAT 1H	Living Room	25.40	18.90	9.63	51%	150	YES
	R20	FLAT 1I	Bedroom	9.76	6.36	4.29	68%	100	YES
	R21	FLAT 1I	Living Room	26.40	20.05	9.96	50%	150	YES
Second	R1	FLAT 2A	Bedroom	11.43	7.59	7.08	93%	100	YES
	R2	FLAT 2A	Bedroom	8.56	5.36	5.36	100%	100	YES
	R3	FLAT 2A	Living Room	23.68	16.44	13.70	83%	150	YES
	R4	FLAT 2B	Bedroom	9.31	5.97	5.97	100%	100	YES
	R5	FLAT 2B	Living Room	24.19	18.25	18.25	100%	150	YES
	R6	FLAT 2B	Bedroom	12.28	8.22	8.22	100%	100	YES
	R7	FLAT 2C	Living Room	23.18	17.33	11.93	69%	150	YES
	R8	FLAT 2C	Bedroom	11.85	7.82	7.82	100%	100	YES
	R9	FLAT 2D	Living Room	30.28	22.40	21.35	95%	150	YES
	R22	FLAT 2D	Bedroom	11.21	7.40	7.40	100%	100	YES
	R23	FLAT 2D	Bedroom	11.02	7.36	7.36	100%	100	YES
	R10	FLAT 2E	Living Room	27.79	21.39	9.87	46%	150	BELOW
	R11	FLAT 2E	Bedroom	9.41	6.09	6.09	100%	100	YES
	R21	FLAT 2E	Bedroom	10.88	7.25	7.25	100%	100	YES
	R12	FLAT 2F	Living Room	24.13	17.98	9.96	55%	150	YES
	R13	FLAT 2F	Bedroom	13.02	8.88	8.88	100%	100	YES
	R14	FLAT 2G	Bedroom	10.45	6.79	6.79	100%	100	YES
	R15	FLAT 2G	Bedroom	10.35	6.71	6.71	100%	100	YES
	R16	FLAT 2G	Living Room	27.00	20.58	19.09	93%	150	YES
	R17	FLAT 2H	Bedroom	11.96	7.93	3.93	50%	100	YES
	R18	FLAT 2H	Living Room	25.40	18.90	18.90	100%	150	YES
	R19	FLAT 2I	Bedroom	9.76	6.36	6.36	100%	100	YES
	R20	FLAT 2I	Living Room	26.40	20.05	19.97	100%	150	YES

GROUND FLOOR



FIRST FLOOR



SECOND FLOOR

SOURCES

SDA KEY

SDA Achieving req.Lux

SDA Below req.Lux

REV.	NOTES	DWN	DATE

Notes:

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DRAWN	-
CHECKED	-

SCALE

NTS (A3 Sheet)

19-37 Highgate Road

Self-test Daylight SDA

Job No	Rev	Drawing Number
2096H	-	1002

Date : 2022.07.13

Appendix 2 - Self-test review of Sunlight

Table 2 – Self-test – Sunlight Exposure

Table 2 - Self-test Sunlight Exposure

Floor Ref	Room Ref	Flat Ref	Room Use	Window Ref	Window Orientation	Proposed Sunlight Exposure (Hours)	Rating
Proposed Residential Units							
Ground	R1	FLAT 0A	Living Room	W1	155°	1.6	
				W2	155°	3.9	
						3.9	Medium
Ground	R2	FLAT 0A	Bedroom	W3	155°	5.5	
						5.5	High
Ground	R3	FLAT 0B	Living Room	W4	155°	7.5	
				W5	155°	7.8	
						7.9	High
Ground	R4	FLAT 0B	Bedroom	W6	48°N	2.5	
						2.5	Minimum
Ground	R5	FLAT 0C	Living Room	W7	48°N	2.5	
				W8	48°N	2.5	
						2.5	Minimum
Ground	R6	FLAT 0C	Bedroom	W9	48°N	2.5	
						2.5	Minimum
Ground	R7	FLAT 0D	Living Room	W10	48°N	0.7	
						0.7	Failed
Ground	R8	FLAT 0D	Bedroom	W11	48°N	2.5	
						2.5	Minimum
Ground	R9	FLAT 0E	Living Room	W12	48°N	2.5	
						2.5	Minimum
Ground	R10	FLAT 0E	Bedroom	W13	48°N	2.5	
						2.5	Minimum
First	R1	FLAT 1A	Bedroom	W1	318°N	0	
						0	Failed
First	R2	FLAT 1A	Bedroom	W2	228°	3.4	
						3.4	Medium
First	R3	FLAT 1A	Living Room	W3	228°	4	
				W4	138°	4	
						6.3	High
First	R4	FLAT 1B	Bedroom	W5	155°	7.9	
						7.9	High
First	R5	FLAT 1B	Living Room	W6	155°	7.9	
				W7	155°	8.1	
				W8	48°N	2.4	
						8.5	High
First	R6	FLAT 1B	Bedroom	W9	48°N	1.9	
						1.9	Minimum
First	R7	FLAT 1C	Living Room	W10	48°N	0.5	
						0.5	Failed
First	R8	FLAT 1C	Bedroom	W11	48°N	1.3	
						1.3	Failed
First	R9	FLAT 1D	Living Room	W12	48°N	0	
				W13	48°N	1.3	
						1.3	Failed
First	R23	FLAT 1D	Bedroom	W31	228°	3.9	
						3.9	Medium
First	R24	FLAT 1D	Bedroom	W32	228°	3.1	
						3.1	Medium
First	R10	FLAT 1E	Living Room	W14	48°N	0.5	
						0.5	Failed
First	R11	FLAT 1E	Bedroom	W15	48°N	1.3	
						1.3	Failed
First	R22	FLAT 1E	Bedroom	W30	228°	4.4	
						4.4	High
First	R12	FLAT 1F	Living Room	W16	48°N	0.5	
						0.5	Failed
First	R13	FLAT 1F	Bedroom	W17	48°N	1	
						1	Failed
First	R14	FLAT 1F	Bedroom	W18	48°N	2	
						2	Minimum
First	R15	FLAT 1G	Bedroom	W19	48°N	2.5	
						2.5	Minimum
First	R16	FLAT 1G	Bedroom	W20	48°N	2.5	
						2.5	Minimum
First	R17	FLAT 1G	Living Room	W21	48°N	0	
				W22	318°N	1.6	
						1.6	Minimum
First	R18	FLAT 1H	Bedroom	W23	318°N	1.7	
						1.7	Minimum
First	R19	FLAT 1H	Living Room	W24	318°N	0.4	
				W25	228°	2.3	
				W26	228°	3.5	
						3.9	Medium
First	R20	FLAT 1I	Bedroom	W27	228°	3.5	
						3.5	Medium
First	R21	FLAT 1I	Living Room	W28	228°	3.5	
				W29	138°	4	
						4.7	High

Table 2 - Self-test Sunlight Exposure

Floor Ref	Room Ref	Flat Ref	Room Use	Window Ref	Window Orientation	Proposed Sunlight Exposure (Hours)	Rating
Second	R1	FLAT 2A	Bedroom	W1	318°N	2	
						2	Minimum
Second	R2	FLAT 2A	Bedroom	W2	228°	7.1	
						7.1	High
Second	R3	FLAT 2A	Living Room	W3	228°	7.1	
				W4	138°	4.2	
						9.1	High
Second	R4	FLAT 2B	Bedroom	W5	155°	8.2	
						8.2	High
Second	R5	FLAT 2B	Living Room	W6	155°	8.3	
				W7	155°	8.4	
				W8	48°N	2.4	
						8.7	High
Second	R6	FLAT 2B	Bedroom	W9	48°N	1.9	
						1.9	Minimum
Second	R7	FLAT 2C	Living Room	W10	48°N	0.5	
						0.5	Failed
Second	R8	FLAT 2C	Bedroom	W11	48°N	1.3	
						1.3	Failed
Second	R9	FLAT 2D	Living Room	W12	48°N	0	
				W13	48°N	1.3	
						1.3	Failed
Second	R22	FLAT 2D	Bedroom	W31	228°	5.3	
						5.3	High
Second	R23	FLAT 2D	Bedroom	W32	228°	4.6	
						4.6	High
Second	R10	FLAT 2E	Living Room	W14	48°N	0.5	
						0.5	Failed
Second	R11	FLAT 2E	Bedroom	W15	48°N	1.3	
						1.3	Failed
Second	R21	FLAT 2E	Bedroom	W30	228°	5.9	
						5.9	High
Second	R12	FLAT 2F	Living Room	W16	48°N	0.5	
						0.5	Failed
Second	R13	FLAT 2F	Bedroom	W17	48°N	1	
				W18	48°N	2	
						2	Minimum
Second	R14	FLAT 2G	Bedroom	W19	48°N	2.5	
						2.5	Minimum
Second	R15	FLAT 2G	Bedroom	W20	48°N	2.5	
						2.5	Minimum
Second	R16	FLAT 2G	Living Room	W21	48°N	0	
				W22	318°N	1.5	
						1.5	Minimum
Second	R17	FLAT 2H	Bedroom	W23	318°N	1	
						1	Failed
Second	R18	FLAT 2H	Living Room	W24	318°N	1.6	
				W25	228°	5.6	
				W26	228°	6.3	
						6.8	High
Second	R19	FLAT 2I	Bedroom	W27	228°	6.3	
						6.3	High
Second	R20	FLAT 2I	Living Room	W28	228°	6.3	
				W29	138°	4.8	
						6.8	High