81 Avenue Road

Daylight and Sunlight Assessment

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14701/IR/BK

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Contents

Appendices

1.0 Introduction

1.1 This report considers the effects of the proposed development at No. 81 Avenue Road in Camden on the levels of daylight and sunlight received by nearby residential properties. It also considers the levels of natural light that will be experienced within the new accommodation at the site.

1.2 The daylight and sunlight assessment considers the effects of the proposal on neighbouring residential properties at Nos. 62, 79 and 83 Avenue Road and properties on Queensmead. It also considers the levels of daylight and sunlight that will be received within all of the habitable rooms within the development.

1.3 The quantitative assessment has been undertaken in accordance with the guidelines set out in the revised Building Research Establishment (BRE) report "*Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice*" (October 2011). The Guide is intended to be advisory and does not contain mandatory standards. The introduction states:

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

1.4 This assessment has been carried out using the following information:

- Measured site survey drawings;
- Photogrammetric survey of the site and surroundings;
- The planning application drawings;
- Ordnance Survey Superplan digital mapping of the area;
- Aerial photography;
- A photographic survey of the site and surroundings.

1.5 The report is divided into the following subsequent sections:

- Section 2.0 provides a brief description of the site and surroundings and the nature of the proposed development, highlighting features of relevance to the assessment of daylight and sunlight levels;
- Section 3.0 outlines the scope of the assessment;
- Section 4.0 provides an assessment of the impacts of the proposal on levels of daylight;
- Section 5.0 considers the proposal's impacts in terms of sunlighting;

- Section 6.0 provides a summary of the assessment and our conclusions are drawn.

1.6 The assessment is supported by a series of reference plans and results tables at Appendices 1-6.

2.0 Site, Surroundings and the Proposal

Site and Surroundings

2.1 The application site is situated on the south western side of Avenue Road. It is located in a residential area characterised by large detached homes and apartment blocks surrounded by gardens and open spaces.

2.2 The site's north-western and south-eastern boundaries are adjoined by Nos. 83 and 79 Avenue Road respectively. To the south-west, beyond the rear garden of the property sits a row of single storey garages set on Queensmead. Opposite the site is No. 62 Avenue Road.

2.3 On the basis of this review, the assessment of neighbouring properties has focused on the daylight and sunlight levels experienced by Nos. 62, 79 and 83 Avenue Road and properties on Queensmeed. These are the closest neighbouring residential properties to the scheme.

2.4 A complete description of the site and surroundings is provided in the submitted Design and Access Statement.

The Proposal

2.5 The proposed development comprises the development of a detached home of two storeys plus basement and attic storeys.

2.6 The layout of the proposed development is illustrated at Appendix 1.

3.0 Scope of Assessment

3.1 This section of the assessment provides an overview of the scope of the daylight and sunlight assessment in terms of the neighbouring properties and proposed accommodation assessed.

3.2 The scale and layout of the development and the locations of the window reference points and habitable rooms assessed are illustrated at Appendices 1 and 2.

Neighbouring Properties Assessed

3.3 The assessment has provided an analysis of the impacts of the development on natural light levels within neighbouring residential properties.

3.4 As outlined in the preceding section, the assessment has considered the effects of the development on the closest windows serving neighbouring residential accommodation within Nos. 62, 79 and 83 Avenue Road and properties on Queensmeed.

3.5 This comprises the following windows:

Address	**Floor(s)**	**No. windows assessed**	
		Daylight	**Sunlight***
No. 62 Avenue Road	B-G	4 windows	4 windows
No. 79 Avenue Road	G-1	8 windows	2 windows
No. 83 Avenue Road	B-1	18 windows	16 windows
Queensmead	G	3 windows	0 windows
Total		**33 windows**	**22 windows**

Table 3.1: Neighbouring Properties Assessed [*windows orientated within 90 degrees of due south]

3.6 All of these windows serving neighbouring properties have been assessed in terms of Vertical Sky Component (VSC). The south facing windows have also been assessed in terms of annual and winter sunlight availability.

Proposed Units Assessed

3.7 The assessment has considered the levels of light that will be received within all of the habitable rooms within the new residential units in the development.

3.8 This comprises the following windows and rooms:

Floor	No. windows [rooms] assessed	
	Daylight	**Sunlight***
Lower ground	2 windows/ 2 rooms	0 windows
Ground	10 windows/ 4 rooms	6 windows
First	7 windows/ 4 rooms	3 windows
Second	9 windows/ 4 rooms	5 windows
Total	**28 windows/ 14 rooms**	**14 windows**

Table 3.3: Proposed Units Assessed [*windows orientated within 90 degrees of due south]

3.9 The windows within the proposed units have been assessed in terms of ambient daylight (VSC) levels. The rooms they serve have been assessed in terms of internal daylighting (Average Daylight Factor; ADF and Daylight Distribution; DD). The south facing windows have been assessed in terms of annual and winter sunlight availability.

4.0 Daylight

4.1 This section of the assessment assesses the impact of the proposed development on the level of daylight received at the aforementioned window reference points and rooms.

Methodology

4.2 The daylight assessment is based on the analysis of Vertical Sky Component (VSC) and Average Daylight Factor (ADF). Neighbouring properties have been considered in terms of VSC as the room layouts, room types and other parameters required for interior daylight analyses are frequently unknown. The rooms assessed within the proposed development have been assessed in terms of VSC, ADF and DD.

4.3 The following sets out the methodology for calculating VSC, ADF and DD.

Vertical Sky Component

4.4 The level of ambient daylight received by a window is quantified in terms of its Vertical Sky Component (VSC), which represents the amount of vertical skylight falling on a vertical window. The daylight assessment has been based on three dimensional AutoCAD models constructed for the site and surroundings as existing and with the proposed development in place. The heights and locations of the surrounding buildings and the proposed development have been taken from measured site survey information, Ordnance Survey digital plan data, site observations, aerial photography of the site and surroundings and the application drawings.

4.5 The VSC level at each of the windows requiring assessment has been quantified using Waldram Tools daylight and sunlight software (MBS Software Ltd).

4.6 The BRE good practice guide outlines numerical guidelines that represent flexible targets for new developments in relation to the vertical sky component at nearby reference points. The document states that:

*“If the vertical sky component, with the new development in place, is **both** less than 27% **and** less than 0.8 times its former value, then the loss of light is likely to be noticeable.” (our emphasis)*

4.7 The guidelines therefore require that either the VSC target or the degree of change in daylighting are met (i.e. if the 27% target is adhered to, there is no requirement under the BRE guidelines for the resultant VSC level to remain at 0.8 times the former VSC level).

Average Daylight Factor

4.8 The BRE guide advises that the calculation of Average Daylight Factor (ADF) provides an alternative means of assessing the level of daylight received by the interior of the room served by a window. It is an appropriate means of assessment for proposed accommodation where the parameters required for the ADF calculations are known.

4.9 The calculation of ADF provides a more sophisticated method of calculating the daylight level experienced within a room than VSC as it takes into account the size and reflectance of room's surfaces and the number, size and transmittance of its window(s), as well as the ambient daylight level (VSC) received at the window(s).

4.10 The Average Daylight Factor (df) is defined as the average internal illuminance as a percentage of the unobstructed external illuminance under standard overcast conditions.

4.11 ADF can be calculated using the following formula (amended in the updated BRE guide, 2011):

$$df = \frac{TA_W\theta}{A(1-R^2)} \%$$

Where:

T is the diffuse visible transmittance of the glazing (a value of 0.65 is typical for double glazed clear glass; a value of 0.18 is used for obscured glazing);

A_w is the net glazed area of the window (m^2);

θ is the angle of visible sky in degrees;

A is the total area of the room surfaces: ceiling, floor, walls and windows (m^2);

R is the average reflectance (a value of 0.7 is applicable for new/proposed accommodation with light internal surface treatments[1]).

4.12 The BRE guide (2011) contains a separate procedure for floor to ceiling windows and glazed doors. It states that areas of glazing below the working plane should be treated as a separate window and an extra factor is applied to it to take account of the reduced effectiveness of low level glazing in lighting the room. The BRE states that a value equivalent to the floor reflectance can

[1] A 0.7 reflectance value assumes white painted walls and ceiling (0.85) and a medium wooden floor (0.3).

be taken for this factor. An adjustment factor of 0.3 is appropriate for medium timber floors and has been used in this case.

4.13 The approach to assessing internal daylighting using the ADF method is set out at Appendix C of the BRE guide. The BRE guide and British Standard BS8206 set the following minimum recommended ADF levels for different room types:

- Kitchens: 2%;
- Living rooms: 1. 5%;
- Bedrooms: 1%.

Daylight Distribution

4.14 Finally, the analysis of daylight distribution considers the area of a room which can receive an unobstructed view of the sky. It is quantified at working plane height (+0.85m).

4.15 The BRE (2011) guide states:

"If, following construction of a new development, a no-sky line moves so that the area of the existing room which does not receive direct skylight is reduced to less than 0.8 times its former value, this will be noticeable to the occupants."

4.16 Again, the analysis of daylight distribution provides a more sophisticated method of assessing daylight than VSC as it takes into account the size of a room and the size and number of its windows. DD has again been utilised in the analysis of the proposed units and neighbouring buildings/developments where internal layouts are known.

Daylight Results: Neighbouring Properties

4.17 The following table contains the VSC results obtained for the neighbouring properties assessed. The results are set out in full at Appendix 3.

Address	**No. windows**	**Above BRE Guide Levels**		**Below BRE Guide levels**		
		No	%	No	%	Marginal*
No. 62 Avenue Road	4	4	100%	0	0%	-
No. 79 Avenue Road	8	5	62.5%	3	37.5%	2
No. 83 Avenue Road	18	13	72.2%	5	27.8%	4
Queensmead	3	3	100%	0	0%	-
Total	**33**	**25**	**75.8%**	**8**	**24.2%**	**6**

Table 4.1: Summary of VSC Results for Neighbouring Properties
[*Marginal Impact: Within 20% of BRE Guide Level]

4.18 The results of the VSC analysis for neighbouring properties demonstrate that the windows assessed serving No. 62 Avenue Road and the properties on Queensmead will comply fully with the BRE guide levels with the development

in place. These properties will not experience any noticeable effects on their ambient daylight as a result of the development.

4.19 The results show that three windows set in the flank elevation of No. 79 Avenue Road and five windows in the flank of No. 83 Avenue Road will experience VSC levels below the BRE guide levels with the development in place. Six of these eight windows will experience only marginal breaches of the guidance. The central window in each property's return elevation will experience greater losses of daylight; however it appears that these windows each serves a dual aspect room, which benefits from a second window facing away from the site.

4.20 The effects arising from the development and the scheme's level of compliance with the BRE guidance overall are good for a development in Inner London given the flexibility and suburban basis of the BRE guidance.

4.21 Overall, while breaches of the BRE guidance are experienced in relation to neighbouring properties, these effects are isolated and mostly marginal, and they appear to serve dual aspect rooms. The development's daylight impacts are therefore considered acceptable for a development in an urban location in the context of the BRE guidance and relevant policy.

Daylight Results: Proposed Units

4.22 The development has been designed to ensure that daylight levels within the proposed units are maximised. The following table summarises the VSC, ADF and DD results obtained for the proposed residential accommodation within the development. The results are contained in full at Appendices 3, 4 and 5.

Vertical Sky Component						
Address	**No. windows**	**Above BRE Guide Levels**		**Below BRE Guide levels**		
		No	%	No	%	Marginal*
Lower ground	2	0	0%	2	100%	0
Ground	10	8	80%	2	20%	1
First	7	7	100%	0	0%	0
Second	9	9	100%	0	0%	0
Total	**28**	**24**	**85.7%**	**4**	**14.3%**	**1**
Average Daylight Factor						
Address	**No. windows**	**Above BRE Guide Levels**		**Below BRE Guide levels**		
		No	%	No	%	Marginal*
Lower ground	2	2	33.3%	0	0%	-
Ground	4	4	100%	0	0%	-
First	4	4	100%	0	0%	-
Second	4	3	75%	1	25%	1
Total	**14**	**13**	**92.9%**	**1**	**7.1%**	**1**
Daylight Distribution						
Address	**No. windows**	**Above BRE Guide Levels**		**Below BRE Guide levels**		
		No	%	No	%	Marginal*
Lower ground	2	1	50%	1	50%	0
Ground	4	4	100%	0	0%	-
First	4	4	100%	0	0%	-
Second	4	4	100%	0	0%	-
Total	**14**	**13**	**92.1%**	**1**	**7.1%**	**0**

Table 4.2: Proposed Units – Summary of Daylight Results

4.23 The results of the daylight analyses for the proposed units show that most of the windows serving the proposed units will achieve the BRE guide levels for VSC (c. 86%). This is a good level of compliance for a development in London.

4.24 As discussed above, VSC merely provides a measure of the obstructions to skylight taken at the midpoint of each window. It does not take into account the size of each window aperture, the size, layout and nature of the room served by the window, or the number of windows serving a room. In contrast, the calculation of ADF and DD provide more sophisticated methods of calculating the daylight conditions experienced within a room. ADF takes into account the size and reflectance of room's surfaces and the number, size and transmittance of its window(s), as well as the ambient daylight level (VSC) received at the window(s). DD reflects the size and layout of a room and the size and number of its windows. On this basis, the interior daylight analyses provide a better indication of the daylight conditions that will be experienced in the proposed units.

4.25 In this context, the ADF And DD results for the proposed accommodation demonstrate that all but one of the habitable rooms within the development will

achieve the BS/BRE guide levels for their respective room types (92.8%). Again this is a high level of compliance for a development in London. A single bedroom at second floor level will experience an ADF level marginally below the guide level, while a further bedroom at basement level a DD level below the guide level. Bedrooms are of secondary importance to main habitable rooms in the assessment of the daylight and these effects are isolated and marginal

4.26 Overall, it is considered that the proposed residential units within the development will experience good levels of ambient and interior daylight in the context of the BRE guidance.

5.0 Sunlight

5.1 This section of the report assesses the effects of the proposed development on levels of sunlight at the window reference points. As noted at Section 3.0, only windows orientated within 90 degrees of due south require analysis in terms of sunlight availability. The methodology and results are discussed below.

Methodology

5.2 The levels of sunlight availability at the window reference points assessed have been calculated based on the three dimensional AutoCAD models of the site and surroundings with the development in place, using the Waldram Tools daylight and sunlight software. The calculations provide the percentage year round sunlight availability and the percentage of sunlight availability received during the winter months.

5.3 The BRE good practice guide states that the sunlighting experienced by a south facing window should receive more than 25% of annual probable sunlight hours and more than 5% of annual probable sunlight hours during the winter months.

Sunlight Results: Neighbouring Properties

5.4 The following table summarises the sunlight results for neighbouring properties. The results are contained in full at Appendix 3.

Address	**No. windows**	**Above BRE Guide Levels**		**Below BRE Guide levels**		
		No	%	No	%	Marginal*
No. 62 Avenue Road	4	4	100%	0	0%	-
No. 79 Avenue Road	2	2	100%	0	0%	-
No. 83 Avenue Road	16	16	100%	0	0%	-
Queensmead	0	0	100%	0	0%	-
Total	**22**	**22**	**100%**	**0**	**0%**	**-**

Table 5.1: Summary of Sunlight results for neighbouring properties *[*Marginal: within 20% of guide levels]*

5.5 The sunlight analysis for neighbouring properties demonstrates that all of the windows requiring assessment will comply fully with the BRE guide levels for annual and winter sunlight availability. None of these windows will experience a materially noticeable effect in terms of sunlight availability.

5.6 On this basis, the effects of the development on the sunlight levels experienced by neighbouring properties are acceptable in the context of the BRE guidance and relevant policy.

Sunlight Results: Proposed Units

5.7 The following table summarises the sunlight results obtained for the proposed residential accommodation within the development. The results are again contained in full at Appendix 3.

Address	**No. windows**	**Above BRE Guide Levels**		**Below BRE Guide levels**		
		No	%	No	%	Marginal*
Lower ground	0	-	-	-	-	-
Ground	6	6	100%	0	0%	-
First	3	3	100%	0	0%	-
Second	5	5	100%	0	0%	-
Total	**14**	**14**	100%	**0**	0%	**-**

Table 5.2: Proposed Units – Summary of Sunlight Results

5.8 The results of the sunlight analyses for the proposed units show that the all of the windows requiring assessment will achieve the BRE guide levels for annual and winter sunlight availability (100% compliance).

5.9 The proposed units will therefore experience good levels of sunlight both during the winter months and throughout the year.

6.0 Summary and Conclusions

6.1 The assessment has considered the effects of the development at No. 81 Avenue Road on the levels of daylight and sunlight received by neighbouring residential accommodation at Nos. 62, 79 and 83 Avenue Road and properties on Queensmead. Other properties in the vicinity of the site are situated a sufficient distance from the site to be unaffected in daylight and sunlight terms.

6.2 Overall, the assessment has considered the effects of the development on daylight levels experienced by 33 windows serving neighbouring properties. Twenty two of these windows also require analysis in terms of sunlight availability.

6.3 Within the development, the assessment has considered the daylight levels that will be experienced by 28 windows and all 14 habitable rooms. The sunlight levels that will be received by 14 south facing windows have also been assessed.

6.4 The following summarises the development's daylight, sunlight and shadow effects.

Daylight

6.5 The daylight assessment demonstrates that the development will not cause any unacceptable effects in terms of neighbouring properties' daylight conditions. All but two of the neighbouring windows requiring assessment will either comply with the BRE guide levels for VSC or experience only marginal departures from the guidance. The remaining two windows appear to serve dual aspect rooms, each with a second window facing away from the site.

6.6 The results of the daylight analyses for neighbouring properties are good for a development in London. It is, therefore, concluded that the development will not result in any materially unacceptable impacts on the daylight levels of neighbouring residential properties.

6.7 The results of the daylight analysis for the proposed residential units within the development show that c. 92.1% of the proposed habitable rooms will achieve the BS/BRE guide levels for ADF and DD. In each case a single bedroom will experience a level of ADF or DD marginally below the guide levels. The proposed accommodation will, therefore, experience good levels of interior daylight.

Sunlight

6.8 The sunlight analysis demonstrates that all of the windows serving neighbouring properties that require assessment will comply with the BRE guide levels for annual and winter sunlight availability. The development will not give rise to any unacceptable effects in terms of the sunlight availability experienced by all neighbouring properties.

6.9 Similarly, all of the windows requiring assessment within the development will achieve the BRE guide levels for annual and winter sunlight. The proposed accommodation will, therefore, experience good levels of sunlight in the context of the BRE guide.

Overall Conclusions

6.10 The results of the assessment demonstrate that the neighbouring residential properties and the proposed accommodation will receive good levels of daylight and sunlight following construction of the proposed development. The proposed development will contain accommodation with good levels of interior daylight and sunlight.

6.11 In conclusion, the proposed development will not give rise to any materially unacceptable daylight and sunlight effects in the context of the BRE guidelines and relevant planning policy.

Appendix 1

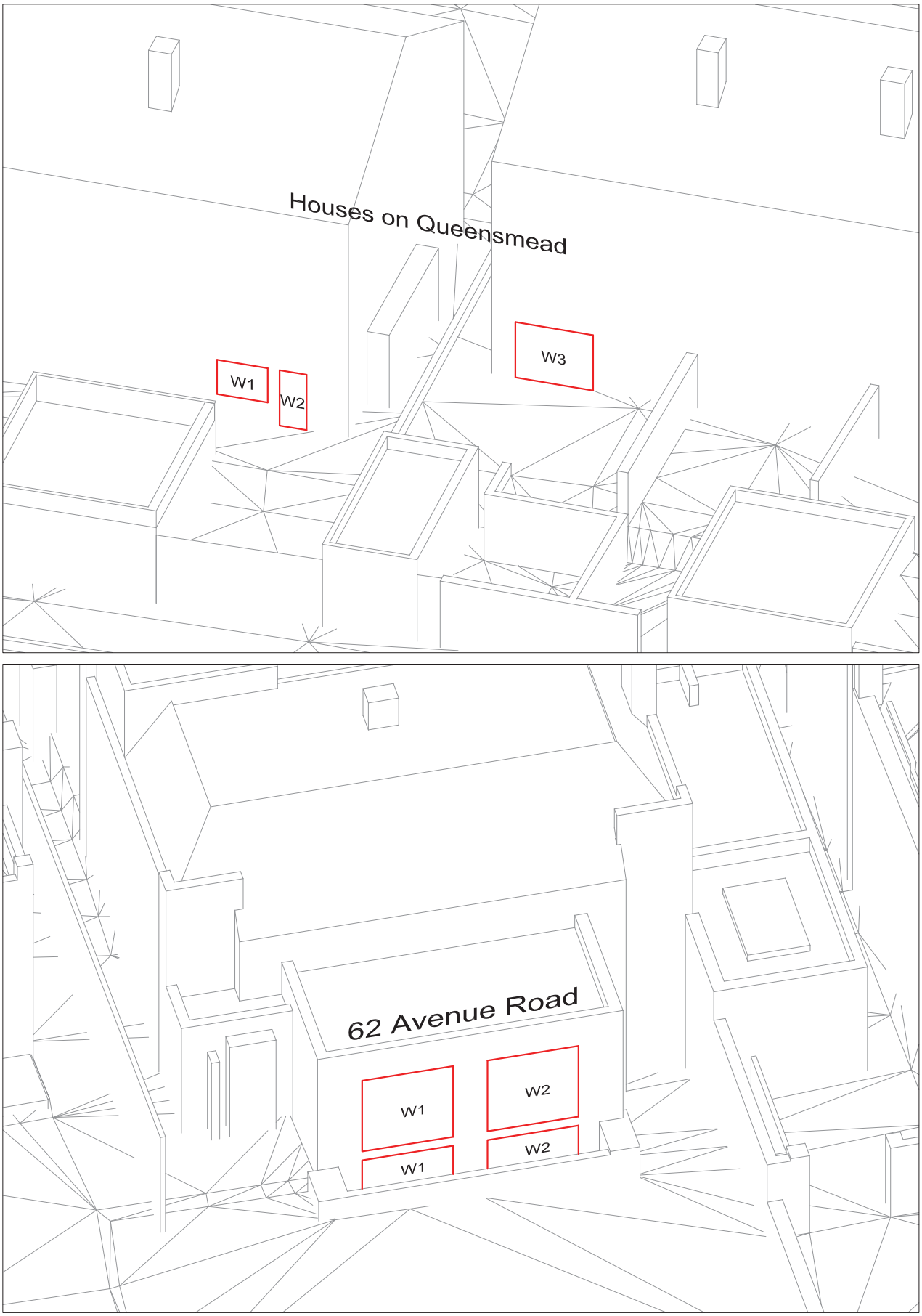
Assessment Model

Model as Existing

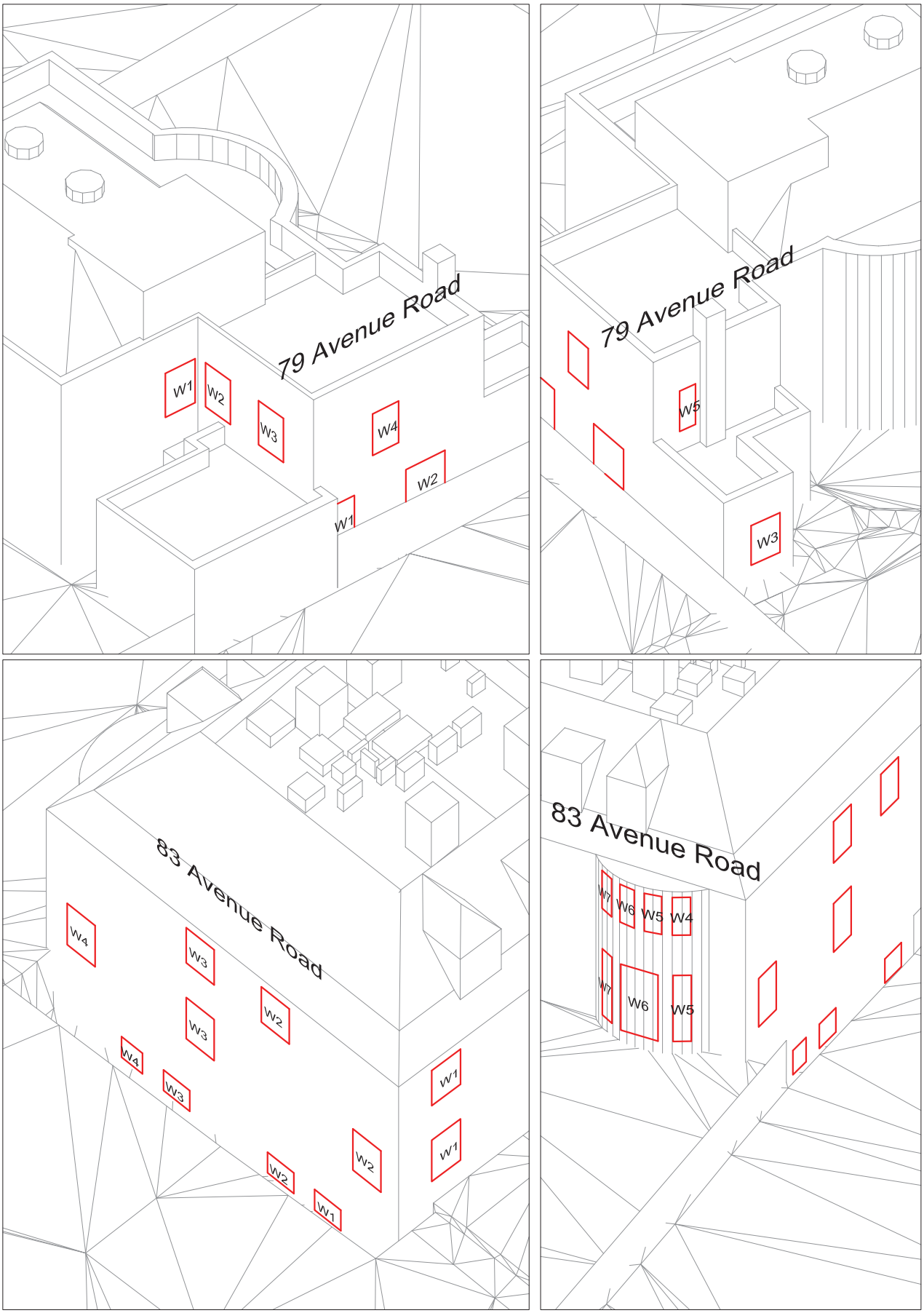
Model as Proposed

Appendix 2

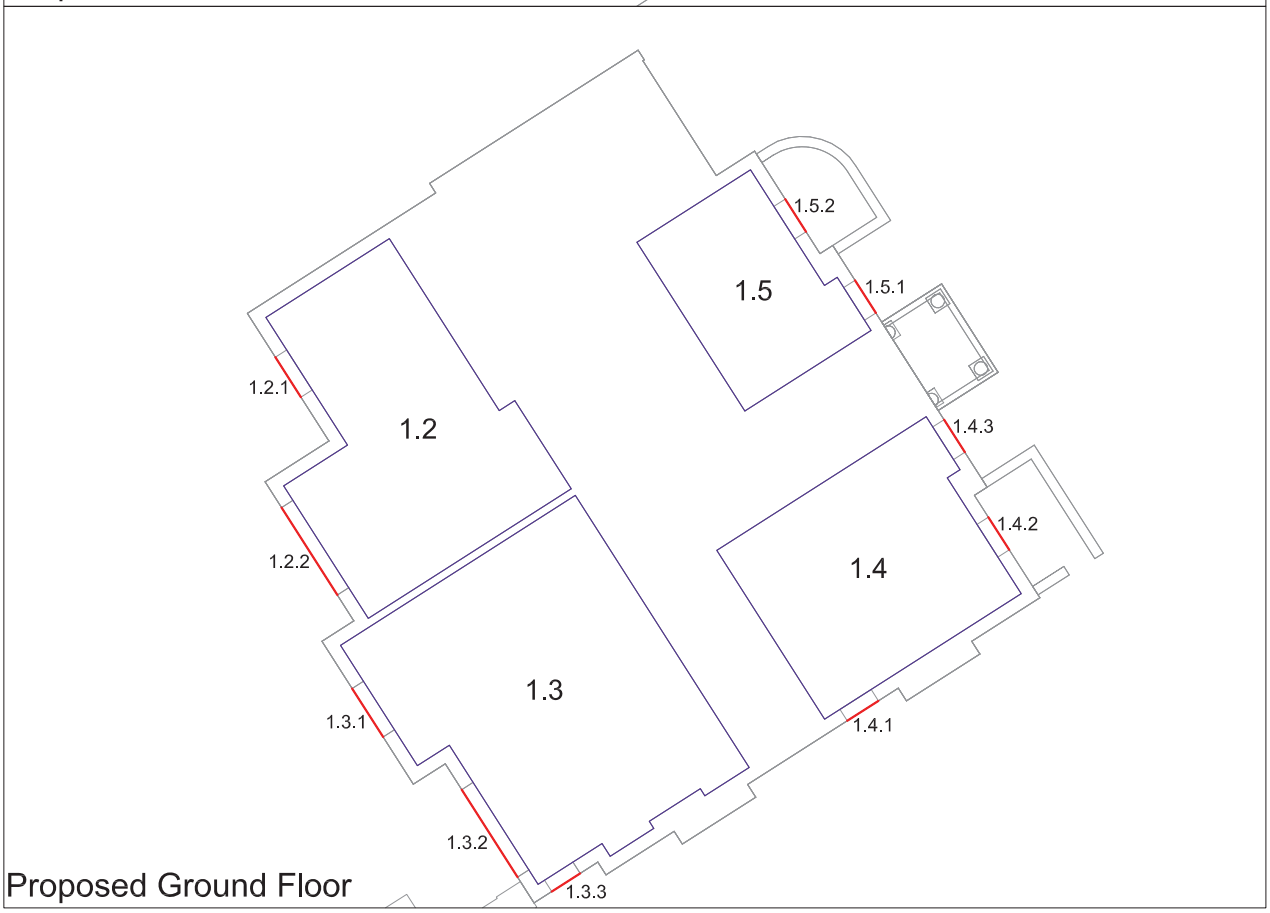
Room & Window Layouts



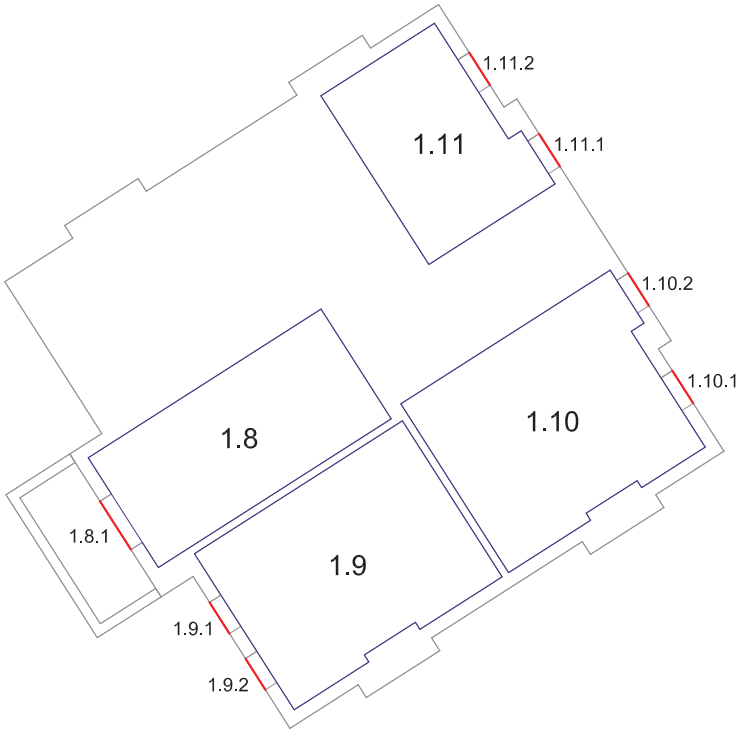
Surrounding Windows Assessed



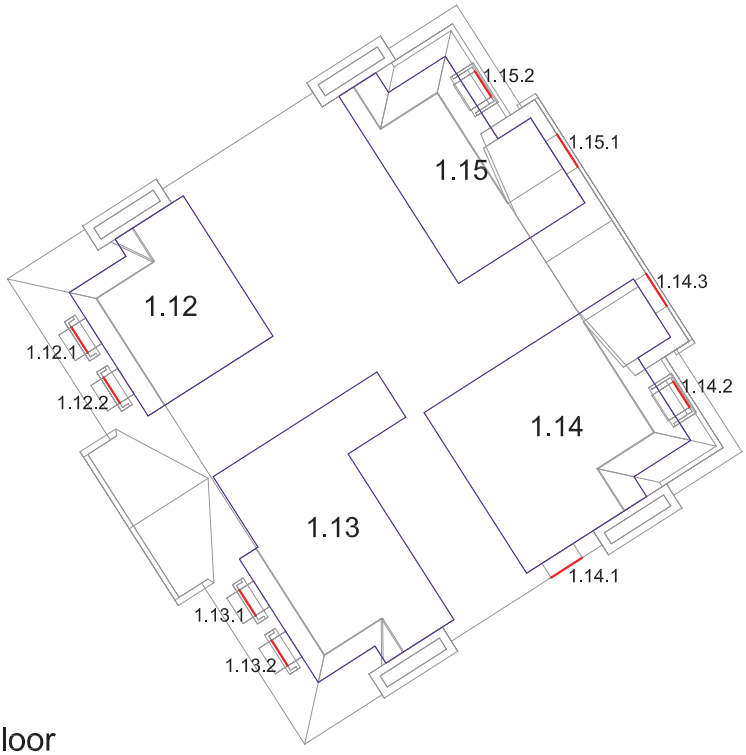
Surrounding Windows Assessed



Proposed Room and Window Layouts



Proposed First Floor



Proposed Second Floor

Proposed Room and Window Layouts

Appendix 3

VSC and Sunlight Results

Appendix 3 - VSC and Sunlight Results

Floor Ref.	Window Ref.		VSC	Difference	Above / Below	Window Orientation	Annual	Difference	Above / Below	Winter	Difference	Above / Below
62 Avenue Road												
Basement	W1	Existing	13.69	1.00	Above	229°	24	1.00	Above	3	1.00	Above
		Proposed	13.69				24			3		
	W2	Existing	13.68	1.00	Above	229°	21	1.00	Above	1	1.00	Above
		Proposed	13.68				21			1		
Ground	W1	Existing	35.79	1.00	Above	229°	64	1.00	Above	21	1.00	Above
		Proposed	35.70				64			21		
	W2	Existing	35.55	1.00	Above	229°	63	1.00	Above	20	1.00	Above
		Proposed	35.47				63			20		
79 Avenue Road												
Ground	W1	Existing	5.25	0.74	Below (M)	325°N	North Facing					
		Proposed	3.88									
	W2	Existing	7.82	0.97	Above	325°N	North Facing					
		Proposed	7.55									
	W3	Existing	33.36	1.00	Above	235°	60	1.00	Above	22	1.00	Above
		Proposed	33.34				60			22		
First	W1	Existing	20.22	0.79	Below (M)	325°N	North Facing					
		Proposed	15.89									
	W2	Existing	23.14	0.93	Above	55°N	North Facing					
		Proposed	21.59									
	W3	Existing	30.32	0.91	Above	55°N	North Facing					
		Proposed	27.63									
	W4	Existing	19.26	0.44	Below	325°N	North Facing					
		Proposed	8.56									
	W5	Existing	30.71	1.01	Above	235°	44	1.00	Above	13	1.00	Above
		Proposed	30.97				44			13		
83 Avenue Road												
Basement	W1	Existing	4.10	1.13	Above	149°	8	1.63	Above	0	0.00	Above
		Proposed	4.65				13			2		
	W2	Existing	3.76	1.44	Above	149°	8	2.13	Above	0	0.00	Above
		Proposed	5.41				17			2		
	W3	Existing	2.88	2.52	Above	149°	10	1.90	Above	1	2.00	Above
		Proposed	7.27				19			2		
	W4	Existing	3.05	2.63	Above	149°	9	2.00	Above	0	0.00	Above
		Proposed	8.02				18			2		
Ground	W1	Existing	35.39	1.00	Above	59°N	North Facing					
		Proposed	35.34									
	W2	Existing	31.27	0.72	Below (M)	149°	74	0.73	Above	20	0.40	Above
		Proposed	22.61				54			8		
	W3	Existing	26.90	0.58	Below	149°	71	0.59	Above	18	0.50	Above
		Proposed	15.49				42			9		
	W4	Existing	29.07	0.76	Below (M)	149°	72	0.69	Above	19	0.89	Above
		Proposed	22.03				50			17		
	W5	Existing	33.27	0.98	Above	208°	65	0.95	Above	23	0.91	Above
		Proposed	32.60				62			21		
	W6	Existing	32.29	1.00	Above	238°	59	1.00	Above	21	1.00	Above
		Proposed	32.28				59			21		
	W7	Existing	29.91	1.00	Above	268°	42	1.00	Above	12	1.00	Above
		Proposed	29.91				42			12		
First	W1	Existing	36.95	1.00	Above	59°N	North Facing					
		Proposed	36.93									
	W2	Existing	35.17	0.68	Below (M)	149°	81	0.74	Above	26	0.31	Above
		Proposed	23.79				60			8		
	W3	Existing	34.96	0.67	Below (M)	149°	80	0.75	Above	25	0.48	Above
		Proposed	23.43				60			12		
	W4	Existing	35.07	0.99	Above	208°	70	1.00	Above	23	1.00	Above
		Proposed	34.73				70			23		
	W5	Existing	34.22	1.00	Above	228°	62	1.00	Above	22	1.00	Above
		Proposed	34.18				62			22		
	W6	Existing	33.30	1.00	Above	248°	53	1.00	Above	18	1.00	Above
		Proposed	33.30				53			18		
	W7	Existing	31.76	1.00	Above	268°	39	1.00	Above	12	1.00	Above
		Proposed	31.76				39			12		

Appendix 3 - VSC and Sunlight Results											
Floor Ref.	**Window Ref.**		**VSC**	**Difference**	**Above / Below**	**Window Orientation**	**Annual**	**Difference**	**Above / Below**	**Winter**	**Difference**	**Above / Below**
Houses on Queensmead												
Ground	W1	Existing Proposed	34.67 34.55	1.00	Above	59°N	North Facing					
	W2	Existing Proposed	36.24 36.02	0.99	Above	59°N	North Facing					
	W3	Existing Proposed	34.28 34.10	0.99	Above	59°N	North Facing					

Appendix 3 - VSC and Sunlight Results

Floor Ref.	Window Ref.		VSC	Difference	Above / Below	Window Orientation	Annual	Difference	Above / Below	Winter	Difference	Above / Below
81 Avenue Road												
Basement	1.6.1	Existing	N/A	N/A	Below	57°N	North Facing					
		Proposed	10.43									
	1.7.1	Existing	N/A	N/A	Below	327°N	North Facing					
		Proposed	7.12									
Ground	1.2.1	Existing	N/A	N/A	Above	237°	0	0.00	Above	0	0.00	Above
		Proposed	29.49				36			8		
	1.2.2	Existing	N/A	N/A	Above	237°	0	0.00	Above	0	0.00	Above
		Proposed	31.22				41			12		
	1.3.1	Existing	N/A	N/A	Above	237°	0	0.00	Above	0	0.00	Above
		Proposed	32.81				44			15		
	1.3.2	Existing	N/A	N/A	Above	237°	0	0.00	Above	0	0.00	Above
		Proposed	31.72				48			18		
	1.3.3	Existing	N/A	N/A	Below (M)	147°	0	0.00	Above	0	0.00	Above
		Proposed	24.75				33			13		
	1.4.1	Existing	N/A	N/A	Below	147°	0	0.00	Above	0	0.00	Below
		Proposed	16.86				25			0		
	1.4.2	Existing	N/A	N/A	Above	57°N	North Facing					
		Proposed	33.83									
	1.4.3	Existing	N/A	N/A	Above	57°N	North Facing					
		Proposed	28.25									
	1.5.1	Existing	N/A	N/A	Above	57°N	North Facing					
		Proposed	28.07									
	1.5.2	Existing	N/A	N/A	Above	57°N	North Facing					
		Proposed	33.50									
First	1.8.1	Existing	N/A	N/A	Above	237°	0	0.00	Above	0	0.00	Above
		Proposed	34.17				45			15		
	1.9.1	Existing	N/A	N/A	Above	237°	0	0.00	Above	0	0.00	Above
		Proposed	30.66				40			13		
	1.9.2	Existing	N/A	N/A	Above	237°	0	0.00	Above	0	0.00	Above
		Proposed	33.37				41			13		
	1.10.1	Existing	N/A	N/A	Above	57°N	North Facing					
		Proposed	36.10									
	1.10.2	Existing	N/A	N/A	Above	57°N	North Facing					
		Proposed	36.89									
	1.11.1	Existing	N/A	N/A	Above	57°N	North Facing					
		Proposed	36.84									
	1.11.2	Existing	N/A	N/A	Above	57°N	North Facing					
		Proposed	35.89									
Second	1.12.1	Existing	N/A	N/A	Above	237°	0	0.00	Below (M)	0	0.00	Above
		Proposed	34.10				24			9		
	1.12.2	Existing	N/A	N/A	Above	237°	0	0.00	Below (M)	0	0.00	Above
		Proposed	33.11				24			9		
	1.13.1	Existing	N/A	N/A	Above	237°	0	0.00	Above	0	0.00	Above
		Proposed	33.83				25			9		
	1.13.2	Existing	N/A	N/A	Above	237°	0	0.00	Above	0	0.00	Above
		Proposed	34.51				25			9		
	1.14.1	Existing	N/A	N/A	Above	147°	0	0.00	Above	0	0.00	Above
		Proposed	38.07				44			20		
	1.14.2	Existing	N/A	N/A	Above	57°N	North Facing					
		Proposed	34.42									
	1.14.3	Existing	N/A	N/A	Above	57°N	North Facing					
		Proposed	37.64									
	1.15.1	Existing	N/A	N/A	Above	57°N	North Facing					
		Proposed	37.59									
	1.15.2	Existing	N/A	N/A	Above	57°N	North Facing					
		Proposed	33.97									

Appendix 4

ADF Results

Appendix 4 - ADF Results

Floor Ref.	Room Ref.	Property Type	Room Use.	Window Ref.	Glass Transmittance	Glazed Area	Clear Sky Angle	Room Surface Area	Average Surface Reflectance	Below Working Plane Factor	ADF	Req'd Value	Above / Below
81 Avenue Road													
Basement	1.6	Residential	Bedroom	1.6.1	0.68	1.78	36.08	60.41	0.70	1.00	1.41		
											1.41	1	Above
Basement	1.7	Residential	Bedroom	1.7.1	0.68	2.10	28.59	78.54	0.70	1.00	1.02		
											1.02	1	Above
Ground	1.2	Residential	LK	1.2.1	0.68	2.13	64.84	208.66	0.70	1.00	0.88		
				1.2.2-L	0.68	2.07	68.92	208.66	0.70	0.30	0.27		
				1.2.2-U	0.68	5.17	68.93	208.66	0.70	1.00	2.28		
											3.43	2	Above
Ground	1.3	Residential	Living Room	1.3.1-L	0.68	1.15	71.27	259.69	0.70	0.30	0.13		
				1.3.1-U	0.68	2.87	71.10	259.69	0.70	1.00	1.05		
				1.3.2-L	0.68	2.07	69.56	259.69	0.70	0.30	0.22		
				1.3.2-U	0.68	5.17	70.01	259.69	0.70	1.00	1.86		
				1.3.3-L	0.68	0.67	49.36	259.69	0.70	0.30	0.05		
				1.3.3-U	0.68	1.46	57.02	259.69	0.70	1.00	0.43		
											3.73	1.5	Above
Ground	1.4	Residential	Dining Room	1.4.1	0.68	1.19	42.62	169.46	0.70	1.00	0.40		
				1.4.2-L	0.68	0.24	71.00	169.46	0.70	0.30	0.04		
				1.4.2-U	0.68	1.93	71.85	169.46	0.70	1.00	1.09		
				1.4.3-L	0.68	0.24	63.66	169.46	0.70	0.30	0.04		
				1.4.3-U	0.68	1.93	61.76	169.46	0.70	1.00	0.94		
											2.50	1.5	Above
Ground	1.5	Residential	Living Room	1.5.1-L	0.68	0.24	63.65	115.84	0.70	0.30	0.05		
				1.5.1-U	0.68	1.93	61.56	115.84	0.70	1.00	1.37		
				1.5.2-L	0.68	0.24	71.04	115.84	0.70	0.30	0.06		
				1.5.2-U	0.68	1.93	71.33	115.84	0.70	1.00	1.58		
											3.06	1.5	Above
First	1.8	Residential	Living Room	1.8.1-L	0.68	1.15	65.03	129.92	0.70	0.30	0.23		
				1.8.1-U	0.68	2.49	73.24	129.92	0.70	1.00	1.87		
											2.10	1.5	Above
First	1.9	Residential	Bedroom	1.9.1-L	0.68	0.06	66.50	151.67	0.70	0.30	0.01		
				1.9.1-U	0.68	1.60	66.19	151.67	0.70	1.00	0.93		
				1.9.2-L	0.68	0.06	71.71	151.67	0.70	0.30	0.01		
				1.9.2-U	0.68	1.60	71.14	151.67	0.70	1.00	1.00		
											1.95	1	Above
First	1.10	Residential	Bedroom	1.10.1-L	0.68	0.06	75.53	157.94	0.70	0.30	0.01		
				1.10.1-U	0.68	1.67	74.96	157.94	0.70	1.00	1.06		
				1.10.2-L	0.68	0.06	76.77	157.94	0.70	0.30	0.01		
				1.10.2-U	0.68	1.67	76.06	157.94	0.70	1.00	1.07		
											2.15	1	Above
First	1.11	Residential	Bedroom	1.11.1-L	0.68	0.06	76.69	106.48	0.70	0.30	0.02		
				1.11.1-U	0.68	1.67	75.98	106.48	0.70	1.00	1.59		
				1.11.2-L	0.68	0.06	75.19	106.48	0.70	0.30	0.02		
				1.11.2-U	0.68	1.67	74.64	106.48	0.70	1.00	1.56		
											3.19	1	Above
Second	1.12	Residential	Bedroom	1.12.1	0.68	0.67	72.38	102.50	0.70	1.00	0.63		
				1.12.2	0.68	0.67	70.83	102.50	0.70	1.00	0.61		
											1.24	1	Above
Second	1.13	Residential	Bedroom	1.13.1	0.68	0.67	72.15	157.11	0.70	1.00	0.41		
				1.13.2	0.68	0.67	73.17	157.11	0.70	1.00	0.41		
											0.82	1	Below (M)
Second	1.14	Residential	Bedroom	1.14.1-L	0.68	0.10	83.51	157.98	0.70	0.30	0.02		
				1.14.1-U	0.68	1.09	83.43	157.98	0.70	1.00	0.77		
				1.14.2	0.68	0.67	73.44	157.98	0.70	1.00	0.41		
				1.14.3-L	0.68	0.22	78.32	157.98	0.70	0.30	0.04		
				1.14.3-U	0.68	1.03	74.60	157.98	0.70	1.00	0.65		
											1.89	1	Above
Second	1.15	Residential	Bedroom	1.15.1-L	0.68	0.22	78.24	120.13	0.70	0.30	0.06		
				1.15.1-U	0.68	1.03	74.53	120.13	0.70	1.00	0.85		
				1.15.2	0.68	0.67	72.65	120.13	0.70	1.00	0.54		
											1.44	1	Above

Appendix 5

Daylight Distribution Results

Appendix 5 - Daylight Distribution Results							
Floor Ref.	**Room Ref.**	**Property Type**	**Room Use.**		**Room Area**	**Lit Area**	**Above / Below**
81 Avenue Road							
Basement	1.6	Residential	Bedroom	Area m2 % of room	11.04	9.76 88%	Above
	1.7	Residential	Bedroom	Area m2 % of room	15.63	7.54 48%	Below
Ground	1.2	Residential	LK	Area m2 % of room	52.11	51.44 99%	Above
	1.3	Residential	Living Room	Area m2 % of room	71.88	71.43 99%	Above
	1.4	Residential	Dining Room	Area m2 % of room	42.07	41.46 99%	Above
	1.5	Residential	Living Room	Area m2 % of room	24.64	24.00 97%	Above
First	1.8	Residential	Living Room	Area m2 % of room	31.75	30.27 95%	Above
	1.9	Residential	Bedroom	Area m2 % of room	39.86	39.22 98%	Above
	1.10	Residential	Bedroom	Area m2 % of room	41.62	40.99 98%	Above
	1.11	Residential	Bedroom	Area m2 % of room	24.64	24.00 97%	Above
Second	1.12	Residential	Bedroom	Area m2 % of room	20.58	19.67 96%	Above
	1.13	Residential	Bedroom	Area m2 % of room	33.1	29.05 88%	Above
	1.14	Residential	Bedroom	Area m2 % of room	36.22	35.45 98%	Above
	1.15	Residential	Bedroom	Area m2 % of room	23.82	22.68 95%	Above