9 MARESFIELD GARDENS

LONDON NW4 1AS

ANALYSIS

of

SITE LAYOUT

for

DAYLIGHT AND SUNLIGHT

12TH MAY 2016

by

Terence A. Rook. BSc. CEng., MIMechE, FCIBSE

STINTON JONES CONSULTING ENGINEERS LLP
TOR HOUSE, WEST LANE
EAST GRINSTEAD
WEST SUSSEX RH19 4 HH

PLANNING APPLICATION FOR DEVELOPMENT OF 9 MARESFIELD GARDENS

ANALYSIS OF SITE LAYOUT WITH REGARD TO DAYLIGHT AND SUNLIGHT

1. Introduction

A planning application is to be made for alterations to the existing house at 9 Maresfield Road including the addition of additional accommodation at lower ground floor level and changes to room layouts at ground floor level.

A pre planning application advice has been issued by London Borough of Camden on 4th March 2016 reference 2015/6846/PRE.

This report is prepared to accord with the planning requirements of London Borough of Camden, The Mayor's Plan for London, current practice, BS8206 Part 2 (2008) and the BRE Guide Site 'Layout Planning for Daylight and Sunlight: a guide to good practice' (The BRE Guide)

2. Description of Proposed Development.

The site is an existing three storey detached house to the west of Maresfield Gardens.

The site slopes downhill from the road boundary so that the existing rear wall is one storey lower than the ground floor. The lower ground floor is to be extended towards the front boundary to form a whole new floor. The floor it to be subdivided to form flats. There are two options for subdivision both of which are analysed for daylight and sunlight in this report.

The development is to be in accordance with drawings by AS Studio Architectural Services Ltd.

Option 1:

- 2143(EX)001 Location Plan
- 3009 (PRE-PLA)100 Proposed Lower Ground Floor Plan
- 3009 (PRE-PLA)101 Proposed Ground Floor Plan
- 3009 (PRE-PLA)200 Proposed East Elevation
- 3009 (PRE-PLA)201 Proposed Front Elevation CC
- 3009 (PRE-PLA)202 Proposed North Side Elevation
- 3009 (PRE-PLA)203 Proposed West Side Elevation
- 3009 (PRE-PLA)204 Proposed South Side Elevation
- 3009 (PRE-PLA)300 Proposed Section AA

Option 2

- 3009/PRE-PLA/100 Proposed Lower Ground Floor Plan
- 3009/PRE-PLA/101 Proposed Ground Floor Plan

3. Requirements of Planning Authority.

The Pre Planning Advice includes the following relevant to daylight and sunlight:

1. Page 2 last paragraph: Applicant to demonstrate that the units comply with the natural light requirements including window size and orientation in accordance with Camden Planning Guidance 2 (CPG2) pages 53 to 62. A daylight and sunlight assessment in accordance with BRE Guide should be provided.
2. Page 4 first paragraph says that since the development is at basement level, it is not considered necessary to analyse loss of daylight to neighbouring properties.
3. In the conclusion on page 5 it needs to be demonstrated that the basement accommodation is adequate through a daylight and sunlight assessment.

Other relevant provisions are included in:

- The National Planning Policy Framework and National Planning Practice Guidelines
- The Mayor's London Plan 2015

The parts of these documents relevant to daylight and sunlight are as follows:

Mayor's London Plan July 2015

The London Supplementary Planning Guidance Housing 2016
Standard 29 paragraph 1.3.45 cites Policy 7.6B d requiring developments to avoid harm to surrounding land and buildings and recommends application of BRE Guidelines with flexibility. Standard 32 and Paragraph 2.3.37 recommends dual aspect dwellings so as to include better daylight.

The London Sustainable Design and Construction Guide

Appendix 4 of The Guide cites the Code for Sustainable Homes in suggesting as good practice:

5.5.1: Glazing to be not less than 20% of floor area
5.5.2. Direct sunlight to enter at least one room for part of the day. Living rooms, kitchens and dining rooms should have direct sunlight.

Camden Planning Guidance CPG2

Paragraphs 4.20 to 4.24 gives guidance on daylight and sunlight,

Paragraph 4.21 says that habitable rooms should have access to natural daylight and should take advantage of natural sunlight. Developments should meet site layout requirements of the BRE guide.

Paragraph 4.22 says that main living rooms benefit from the sunlight.

Paragraph 4.23 says the following the minimum requirements should be met to avoid unacceptable loss of daylight and sunlight:

- Each dwelling should have one room with a window facing within 30° of south.

- Rooms and south facing walls should always have windows, and south facing windows should be shaded.
- External shading should be provided to west facing windows to minimise overheating in summer.
- Windows in north facing walls should be sized to prevent heat loss but allow sufficient daylight.
- All habitable rooms including basements must have an external window within the area of at least 1/10 of the floor area of the room.

Paragraph 4.24 refers to the code for sustainable homes and gardens and designing internal daylight to rooms reference to the BRE assessment methods.

Paragraph 4.26 says the basement rooms should have access to natural light. Where windows are obstructed by walls or structure within three metres raising should be not less than 10% of floor area.

4. General .

4.1. General Effects of New Development on Light to Adjacent Buildings

As noted in the Camden Pre Planning Advice there is not development above ground that would have any effect on neighbouring houses. No further analysis is necessary.

4.2 Natural lighting to rooms in the development.

The proposed house has some rooms at below ground level. Analysis of daylight and sunlight to the rooms is included in this report.

5. Daylight to Rooms within the Development

5.1. Requirements.

The Camden CPG2 in common with the usual Local Authority requirements and the BRE Guide recommend that new developments satisfy criteria for

- Average daylight factor
- Room Depth
- Vertical Sky Component (VSC) at Windows
- No Sky Area
- Glazing Area of 20% suggested as good practice only.
- Sunlight suggested as good practice only.

These requirements are applied to habitable rooms being Living Rooms, Dining Rooms Bedrooms and in kitchens where possible.

Bathrooms, dressing rooms, store cupboards are not required to meet the criteria.

6.2 Average Daylight Factor.

This is the most important of the criteria because it gives good guide to the illumination of a room by natural daylight.

The Average Daylight Factor (ADF) for rooms within the proposed flats have been calculated by the methods described in BRE Guide Appendix C5 and BS 8206 using the formula:

$ADF = Aw\ T\ \Theta / A(1-R^2)$

Where,

ADF= Daylight factor
Aw = window area
A = Sum of areas of walls, floors and ceilings
R = Average reflectance of walls floors and ceilings taken as 0.5.
Θ = Angle from Table C1 of the 2011 Guide
T = Transmittance of the glass taken as 0.8.

Where windows are partially shaded from the sky by nearby buildings it is necessary to establish the amount of shading using the method described in the BRE Guide. The Vertical Sky Component (VSC) is calculated using a skylight availability diagram and Table C1 is then used to obtain a modified value of Θ for use in the above formula.

The BRE Guide and BS 8206 recommend that average daylight factor exceeds the following values:

For kitchens 2%
For living rooms and dining rooms 1.5%
For bedrooms 1%
Average daylight factor is not applicable to bathrooms, dressing rooms and utility rooms.

The calculations for average daylight factor for all relevant rooms in the development are given in Appendix 2.

In all rooms, except the two small bedrooms at ground floor in the south facing flat in Scheme 2, the recommended minimum values are exceeded. For these two rooms the ADF 0.73 and 0.82 which is lower than the recommended ADF of 1.

6.3 Room Depth.

The BRE Guide recommends that for rooms illuminated from windows in only one wall the distance from the window to most distant wall should not exceed L in the following formula.

$L/W + L/H < 1/(1-R)$

Where W is the width of the room, H is height of window lintel and R is average reflectance at rear of room.

Room depth calculations are in Appendix 2.

In these calculations a very conservative value of R of 0.5 is used.

Rooms with windows to two sides or with a roof light have adequate lighting to the rear of the rooms and are marked NA in the table.

All habitable rooms have good illumination at depth away from the windows satisfying the criterion by a good margin.

6.4. 20% Glazing Area

Appendix 4 of The London Sustainable Design and Construction cites the Code for Sustainable Homes in suggesting as good practice 20% glazing. Glazing areas are in the Table in Appendix 2.

All rooms, except the $12m^2$ bedroom in the south facing flat in Option 2, have glazing areas exceeding 20% thereby complying with this suggestion. The bedroom has a window area of 18.3% which is still very high in comparison with minimum requirements of the Building Regulations and the 10% minimum required in paragraph 4.26 of the Camden CPG 2.

6.5 27 Degree Vertical Sky Component.

Remaining living and dining rooms of the flats at ground and lower ground floors have windows facing west or east. They have a virtually unimpeded view of the sky.

The bedroom windows have restricted outlooks towards adjacent buildings north and south.

The vertical sky component for these windows is calculated by the methods in Appendix A of the BRE Guide.

The results are included in the table in Appendix 2. The results demonstrate that the VSC for the windows in the living rooms satisfy the criteria in the BRE Guide.

6.6. No Sky Areas

The BRE Guide C16 recommends that the area of room with no visible sky on a plane 850 mm above floor should not exceed 20%.

All the windows in the living and dining areas have a virtually unobstructed view of the sky from all parts. View of the sky is however obstructed for the bedroom windows.

Calculated results are included in the table in Appendix 2.

6.7 Sunlight

The Mayor's London Plan 2015 Sustainable Design and Construction Guide cites Code for Sustainable Homes suggesting that direct sunlight enters at least one room for part of the day. Living rooms, kitchens and dining rooms should have direct sunlight. The BRE Guide 3.1.10 recommends that rooms for which occupants expect sunlight should receive 25% of annual probable sunlight hours and 5% in winter.

Sunlight to rooms is estimated using the method described in the BRE Guide Appendix A. Results are included in the table in Appendix 2 of this report.

The suggestion in Code for Sustainable Homes 5.5.2 that sunlight should enter at least one room for part of the day is clearly satisfied for the proposed flats.

7. Conclusion

7.1 Light to Adjacent Houses.

The proposed development will have no effect upon the availability sunlight and daylight to rooms in the adjacent buildings.

7.2. Daylight to Rooms within Proposed Flats.

The Camden Planning Guidance, The Mayor's Plan for London and BRE Guide and BS 8206 include recommendations for provision of daylight.

The recommendations are in six principal criteria:

- Average daylight factor
- Room Depth
- Glazing Area
- Vertical Sky Component (VSC) at Windows
- No Sky Area
- Sunlight.

All rooms have large windows with relatively low front to back depth.

The main living areas being dining and living rooms have excellent daylight and fully meet the recommendations.

The bedrooms are located at the sides of the house facing the flank walls of adjacent houses. The most important criterion in these cases is the average daylight factor and at is sufficient in all the bedrooms except the two small south facing bedrooms at ground floor level in option 2. The other secondary criteria sky visibility do not meet with the full recommendations of the BRE guide.

It is to be expected that houses with large footprints in this densely populated part of Camden will have rooms that do not fully satisfy the requirements for daylight and sunlight. In this proposal the rooms have been configured make the maximum benefit for daylight and sunlight main living and dining areas whilst sacrificing light to bedrooms for which natural light is clearly less important.

The proposed development will be generally in compliance with the recommendations of the Planning Requirements of the London Borough of Camden, The Mayor's London Plan, the BRE Guide and BS 8206.

Terence A Rook Bsc. C.Eng., MIMechE, FCIBSE 13th May 2016.

References:

i. Camden Planning Guidance CPG2
ii.
iii. Building Research Establishment publication 'Site layout and planning for daylight and sunlight, a guide to good practice' published in 2011.
iv. BS 8206 Part 2
v. The Mayors Plan for London 2015
vi. The London Sustainable Design and Construction Guide
vii. The London Supplementary Planning Guidance Housing 2016

Attachments:

Appendix 1:
Figure 1: Option 1 Lower Ground Floor Plan.
Figure 2: Option 1 Ground Floor Plan
Figure 3: Option 2 Lower Ground Floor Plan.
Figure 4: Option 2 Ground Floor Plan

Appendix 2 :

Table of Daylight Factors.

Appendix 1:

Figure 1: Option 1 Lower Ground Floor Plan.

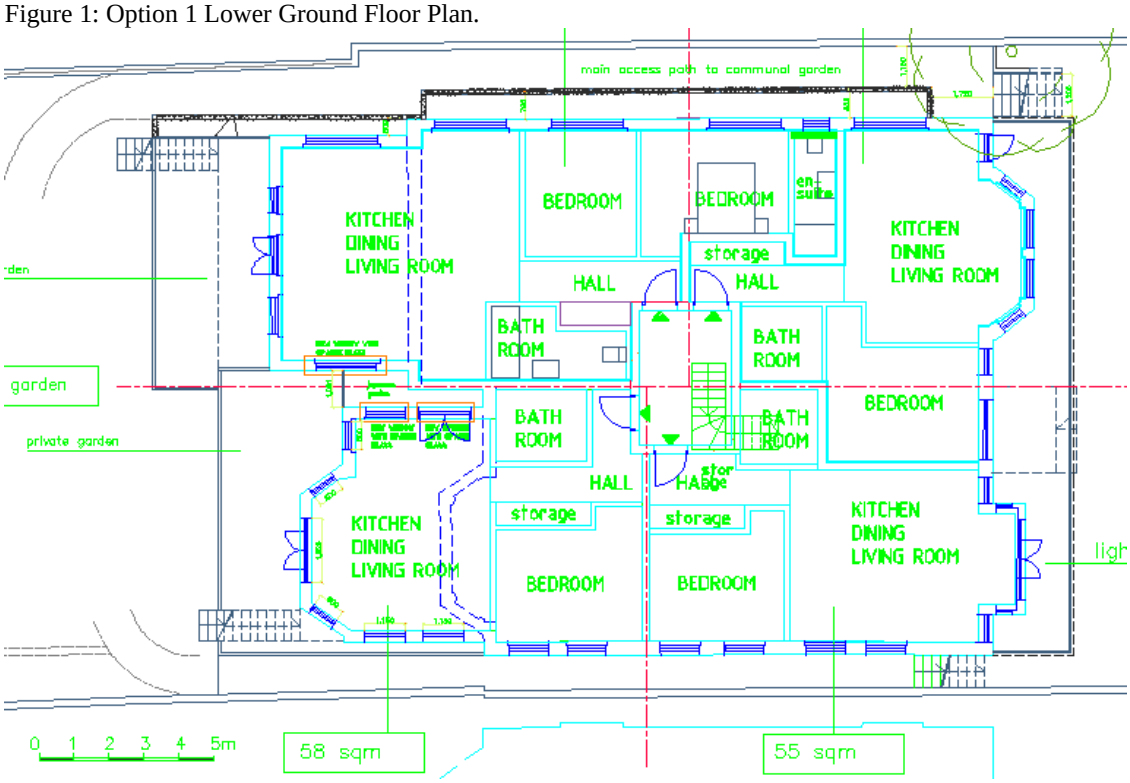


Figure 2: Option 1 Ground Floor Plan

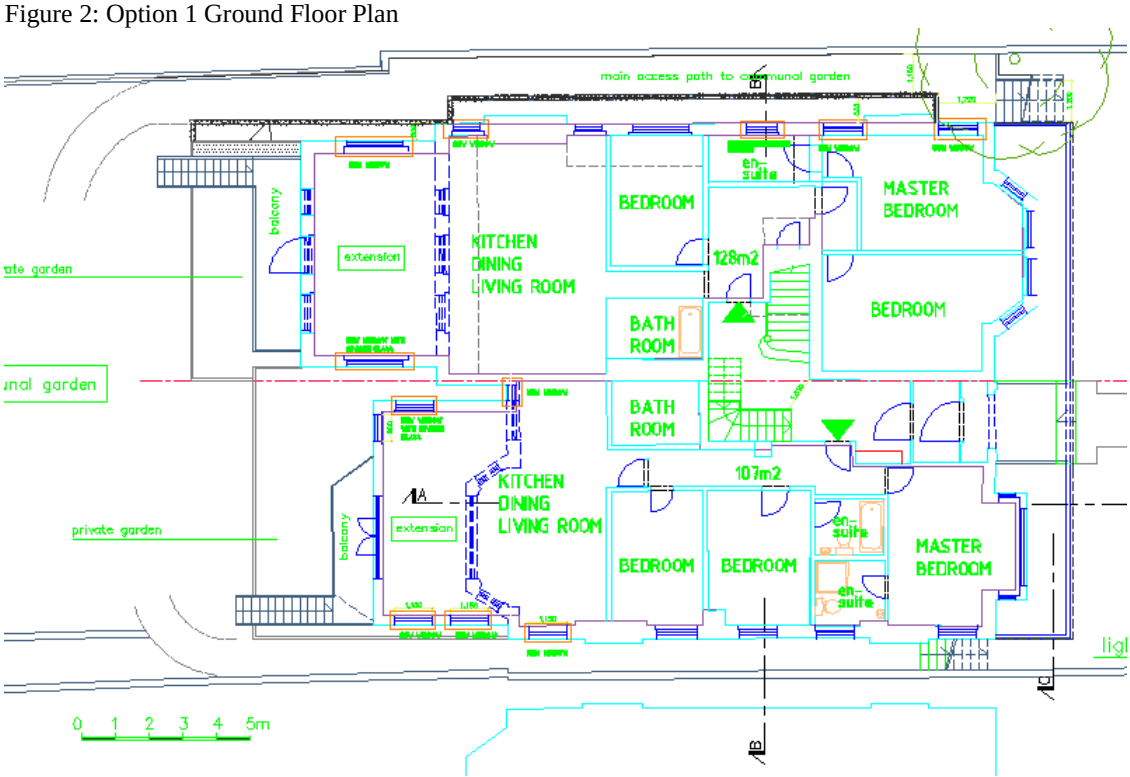


Figure 3: Option 2 Lower Ground Floor Plan

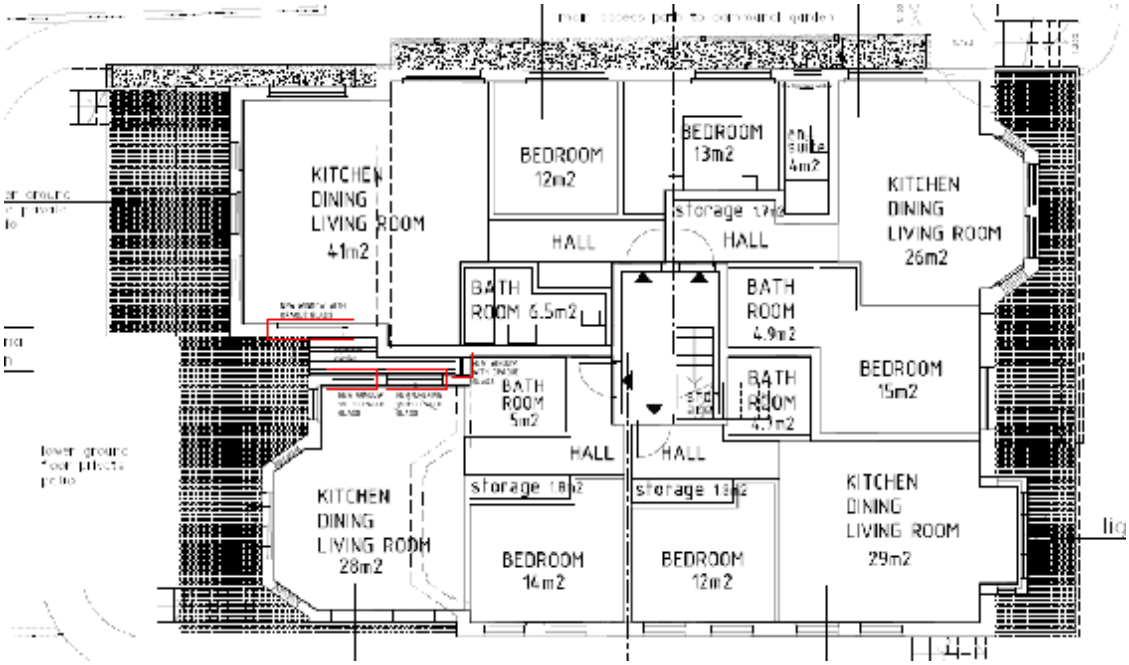
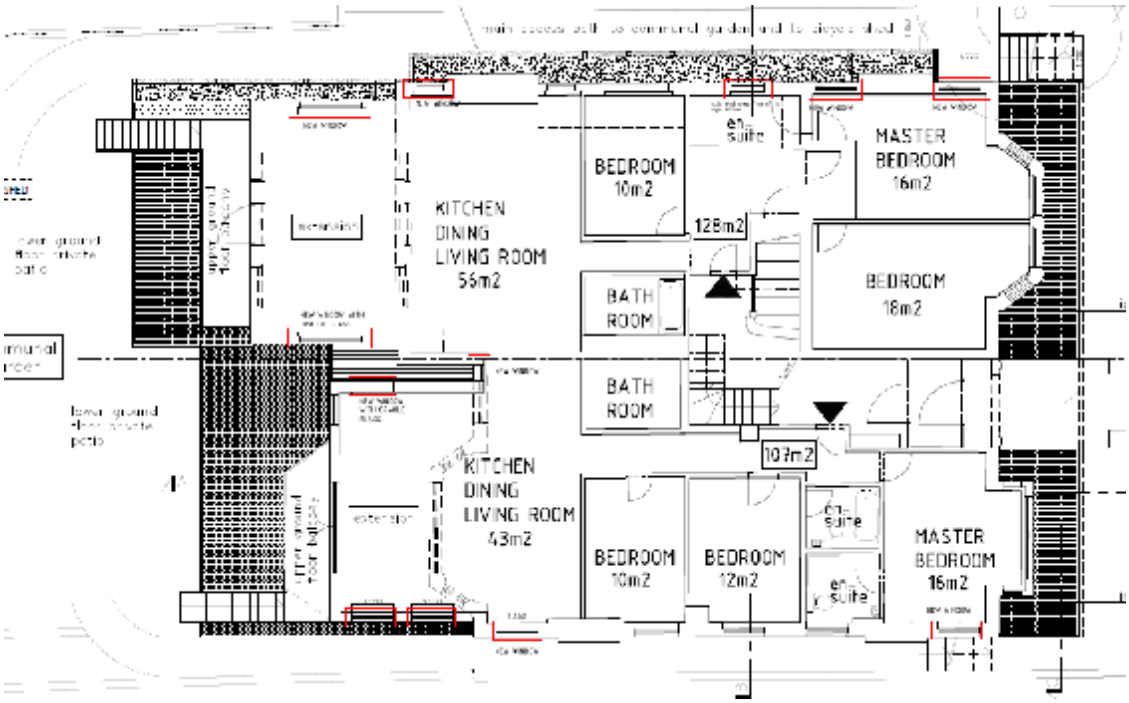


Figure 4 Option 2 Ground Floor Plan.



APPENDIX 2

		Room		Window				ADF							L/W+L/H		Window% Floor Area		Sunlight%APSH		No Sky %
	Notes	Room Depth	Room Width	Window W	Window Height	H above .85	Rm Height	TM	AW	A	Θ	$1-R^2$	ADF	Recommended BS8206 %	L/w+L/H	2/1-R	% Floor area	VSC	Sunlight% APSH	% APSH Winter	No Sky %
Main Proposal 4x 1 Bedroom LGF Flats																					
LGF NE Corner Flat																					
Kitchen living		5	7	4.5	2.3	1.45	2.5	0.8	6.525	130	80	0.75	4.28	2.0	2.9	4	28.3	40	50	29	<10%
Bed 1		4	3.7	1.8	2.3	1.45	2.5	0.8	2.61	68.1	36	0.75	1.47	1.0	2.8	4	26.8	11.1			56
LGF SE Corner Flat																					
Kitchen living		5	7	5.9	2.3	1.45	2.5	0.8	8.555	130	80	0.75	5.62	2.0	NA	NA	37.1	40	50	29	<10%
Bed 1		3.8	3.8	2	2.3	1.45	2.5	0.8	2.9	66.88	24	0.75	1.11	1.0	2.7	4	30.5	3.6			90%
LGF NW Flat																					
Kitchen living:	W7,8,9	7.4	6.5	2.6	2.3	1.45	2.5	0.8	3.77	165.7	80	0.75	1.94		NA	NA	*11.9*	40			
Kitchen living	W5,6	7.4	6.5	3.2	2.3	1.45	2.5	0.8	4.64	165.7	60	0.75	1.79		NA	NA	*14.6*	25			
Kitchen living	All Windows Combined												3.73	2.0	NA	NA	50.3		50	29	<10%
Bed 1		3.8	3.8	2.4	2.3	1.45	2.5	0.8	3.48	66.88	38	0.75	2.11	1.0	2.7	4	36.6	12			17%
LGF SW Corner Flat																					
Kitchen living	W10,11,12,13	5	5.6	3.3	2.3	1.45	2.5	0.8	4.785	109	80	0.75	3.75		NA	NA	*25.9*	40			
Kitchen living	W14,15	5	5.6	2	2.3	1.45	2.5	0.8	2.9	109	60	0.75	1.70		NA	NA	*15.7*	25			
Kitchen living	All Windows Combined												5.45	2.0			41.6		50	29	<10%
Bed 1		3.4	2.6	1.6	2.3	1.45	2.5	0.8	2.32	47.68	26	0.75	1.35	1.0	2.8	4	39.8	5.5			31%
GF North Flat																					
Small Bedroom		3.8	2.7	1.6	2.3	1.45	2.5	0.8	2.32	53.02	26	0.75	1.21	1.0	3.1	4	34.3	5.5			70%
GF South Flat																					
Small bedroom		3.8	2.4	1.1	2.3	1.45	2.5	0.8	1.595	49.24	28	0.75	0.97	1.0	3.2	4	26.5	6.2			95%
Option 1 x 2 Bedroom Plus 3 x 1 Bedroom																					
LGF NE Corner Flat 1 Bed																					
Kitchen living		4.2	6	3.6	2.3	1.45	2.5	0.8	5.22	101.4	80	0.75	4.39	2.0	NA	NA	31.4	40	50	29	<10%
Bedroom		4	3.2	2.2	2.3	1.45	2.5	0.8	3.19	61.6	80	0.75	4.42	1.0	3.0	4	37.8	40			<10%
LGF SE Corner Flat 1 Bedroom																					
Kitchen living:		6	3	4.2	2.3	1.45	2.5	0.8	6.09	81	80	0.75	6.42	2.0	NA	NA	51.3	36	50	29	<10%
Bedroom		3.8	3.8	2	2.3	1.45	2.5	0.8	2.9	66.88	24	0.75	1.11	1.0	2.7	4	30.5	3.6			90%
LGF NW Flat 2 Bedroom																					
Kitchen living:	W7,8,9	6	6	2.6	2.3	1.45	2.5	0.8	3.77	132	80	0.75	2.44		NA	NA	*15.9*	40			
Kitchen living	W5,6	6	6	2	2.3	1.45	2.5	0.8	2.9	132	80	0.75	1.87		NA	NA	*12.2*	40			
Kitchen living	All Windows Combined												4.31	2.0	NA	NA	28.1	40	50	29	<10%
Bed 1		3.6	2.4	2	2.3	1.45	2.5	0.8	2.9	47.28	38	0.75	2.49	1.0	3.1	4	50.9	12			31%
Bed 2		3	4	2	2.3	1.45	2.5	0.8	2.9	59	36	0.75	1.89	1.0	2.1	4	36.7	11.1			24%
LGF SW Corner Flat 1 Bedroom																					
Kitchen living	W10,11,12,13	5	5.6	3.3	2.3	1.45	2.5	0.8	4.785	109	80	0.75	3.75		NA	NA	25.9	40			
Kitchen living	W14,15	5	5.6	2	2.3	1.45	2.5	0.8	2.9	109	60	0.75	1.70		NA	NA	*15.7*	25			
Kitchen living	All Windows Combined												5.45	2.0			41.6		50	29	<10%
Bed 1		3.4	2.6	1.6	2.3	1.45	2.5	0.8	2.32	47.68	26	0.75	1.35	1.0	2.8	4	39.8	5.5			31%
GF North Flat																					
Bedroom		3.8	2.7	1.6	2.3	1.45	2.5	0.8	2.32	53.02	38	0.75	1.77	1.0	3.1	4	34.3	12			57%
GF South Flat																					
Bed 1(12m2)		4	3	1	2.3	1.45	2.5	0.8	1.45	59	28	0.75	0.73	1.0	3.1	4	18.3	6.20%			90%
Bed 2 (10m2)		4	2.5	1	2.3	1.45	2.5	0.8	1.45	52.5	28	0.75	0.82	1.0	3.3	4	22.0	6.50%			90%
															* L/W+L/H (NA) not applicable where room has windows at two sides						