Internal Daylight and Sunlight Report
Eastern Parameter

Camden Lock Village
Project No: 2801

January 1, 2012

DAYLIGHT+SOLAR DESIGN

gia

Client	Stanley Sidings Ltd
Architect	AHMM & MAKE
Project Title	Camden Lock Village
Project Number	2801
Report Title	Internal Daylight and Sunlight Report - Eastern Parameter
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Checked by	SP
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1. Executive Summary

The proposed Camden Lock Village development will provide additional residential accodomation which over all will enjoy good levels of daylight and sunlight. Where an individual room or window has fallen short of the daylight levels recommended by the BRE and the British Standard, they have been commented on in Sections 6.1 and 6.2 of this report.

Overall, 93% of all rooms within the proposed development will achieve daylighting levels which meet or exceed those recommended by the BRE and BS and so we consider the development to be acceptable in terms of daylight and sunlight.

2. Introduction and Objective

GIA has been instructed to provide a report upon the potential availability of Daylight and Sunlight to the proposed accommodation within the residential schemes prepared by MAKE Architects and AHMM Architects. GIA was specifically instructed to carry out the following:

- To create a 3D computer model of the proposal based upon drawings prepared by MAKE Architects and AHMM Architects.
- Carry out a daylight assessment using the methodologies set out in the BRE guidelines for Daylight Distribution, Room Depth Criterion and Average Daylight Factor.
- Carry out a sunlight assessment using the methodologies set out in the BRE guidelines for Annual Probable Sunlight Hours (APSH) to the fenestration facing within 90 degrees of due south.
- Preparation of a report setting out the analysis and our findings.

3. BRE guidelines

The Building Research Establishment (BRE) have set out in their handbook *Site Layout Planning for Daylight and Sunlight a Guide to Good Practice (2011),* guidelines and methodology for the measurement and assessment of daylight and sunlight within proposed buildings. This document states that it is also intended to be used in conjunction with the interior daylight recommendations found within the *British Standard BS8206-2:2008* and *The Applications Manual on Window Design* of the Chartered Institution of Building Services Engineers (CIBSE).

The guide also provides advice on site layout planning to determine the quality of daylight and sunlight within open spaces between buildings.

It is important to note, however, that this document is a guide whose stated aim *"is to help rather than constrain the designer".*

The document provides advice, but also clearly states that it *"is not mandatory and this document should not be seen as an instrument of planning policy."* The report acknowledges also in its introduction that *"in special circumstances the developer or planning authority may wish to use different target values. For example, in a historic City centre a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings."*

It is an inevitable consequence of the built up urban environment that daylight and sunlight will be more limited in these areas. It is well acknowledged that in such situations there may be many other conflicting and potentially more important planning and urban design matters to consider other than just the provision of ideal levels of daylight and sunlight.

3.1. Daylight

The BRE set out various methods for assessing the daylight within a proposed building within section 2.1 and Appendix C of the handbook. The summary of this, given at the end of section 2.1 of the guide, states as follows:

> *"in general, a building will retain the potential for good interior defused daylighting provided that on all its main faces:*
>
> *A. No obstruction, measured in a vertical section perpendicular to the main face, from a point two metres above ground level, subtends an angle of more than 25 degrees to the horizontal;*
>
> *Or*
>
> *B. If (A) is not satisfied, then all points on the main face on a line two metres above ground level are within four metres (measured sideways) of a point which has a vertical sky line component of 27% or more."*

3.1.1. Vertical Sky Component (VSC)

This method of assessment can be undertaken using a skylight indicator or a Waldram diagram. It measures from a single point, at the centre of the window if known at the early design stage, the quantum of sky visible taking into account all external obstructions. Whilst these obstructions can be either other buildings or the general landscape, trees are usually ignored unless they form a continuous or dense belt of obstruction.

The VSC method is a useful 'rule of thumb' but has some significant limitations in determining the true quality of daylight within a proposed building. It does not take into account the size of the window, any reflected light off external obstructions, any reflected light within the room, or the use to which that room is put. Appendix C of the guide goes into more detail on these matters and sets forward alternative methods for assessment to overcome these limitations.

Appendix C of the BRE guide: Interior Daylighting Recommendations, states:

> *"The British Standard for daylighting, and the CIBSE Applications manual: window design, contain advice and guidance on interior daylighting. This guide to good practice is intended to be used in conjunction with them, and its guidance is intended to fit in with their recommendations.*
>
> *For skylight, the British Standard and the CIBSE manual put forward three main criteria, based on the average daylight factor, room depth, and the position of the no skyline."*

These assessments are set out below.

3.1.2. Average Daylight Factor (ADF)

> *"If a predominantly daylit appearance is required, then df should be 5% or more if there is no supplementary electric lighting, or 2% or more if supplementary electric lighting is provided. There are additional recommendations for dwellings, of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms. These last are minimum values of Average Daylight Factor, and should be attained even if a predominantly daylit appearance is not required."*

This method of assessment takes into account the total glazed area to the room, the transmittance quality of the glazing proposed, the total area of the room surfaces including ceilings and floors, and the internal average reflectance for the room being assessed. The method also takes into account the Vertical Sky Component and the quantum of reflected light off external surfaces.

This is, therefore, a significantly more detailed method of assessment than the Vertical Sky Component method set out above.

3.1.3. Room Depth Criteria (RDC)

Where it has access to daylight from windows in one wall only, the depth of a room can become a factor in determining the quantity of light within it. The BRE guidance provides a simple method for examining the ratio of room depth to window area. However, whilst it does take into account internal surface reflections, this method also has significant limitations in that it does not take into account any obstructions outside the window and therefore draws no input from the quantity of light entering the room.

3.1.4. No sky line

This third method of assessment is a simple test to establish where within the proposed room the sky will be visible through the windows, taking into account external obstructions. The assessment is undertaken at working plane

height (850mm above floor level) and the method of calculation is set out in Appendix D of the BRE handbook.

Appendix C of the BRE handbook states *"if a significant area of the working plane lies beyond the no skyline (i.e., it receives no direct skylight), then the distribution of daylight in the room will look poor and supplementary electric lighting will be required."* To guarantee a satisfactory daylight uniformity, this area is more precisely quantified in the BS 8206 Part2 2008 as 20%.

3.1.5. Summary

The Average Daylight Factor gives a more detailed assessment of the daylight within a room and takes into account the highest number of factors in establishing a quantitative output.

However, the conclusion of Appendix C of the BRE guide states:

> *"all three of the criteria need to be satisfied if the whole of the room is to look adequately daylit. Even if the amount of daylight in a room (given by the Average Daylight Factor) is sufficient, the overall daylight appearance will be impaired if its distribution is poor."*

In most urban areas it is important to recognise that the distribution of daylight within a room may be difficult to achieve, given the built up nature of the environment. Consequently, most local authorities seek to ensure that there is sufficient daylight within the room as determined by the Average Daylight Factor calculation. However, the additional recommendations of the BRE and British Standard for residential accommodation, set out above, ought not to be overlooked.

3.2. Sunlight

The BRE provide guidance in respect of sunlight quality for new developments within section 3.1 of the handbook. It is generally acknowledged that the presence of sunlight is more significant in residential accommodation than it is in commercial, and this is reflected in the BRE document.

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

For modern non-domestic buildings the guide states, *"the requirement for sunlight will vary according to the type of non-domestic building, the aim of the designer and the extent to which the occupants can control their environment. People appreciate sunlight more if they can choose whether or not to be exposed to it, either by changing their positions in the room or by using adjustable shading. Where prolonged access to sunlight is available, shading devices will also be needed to avoid overheating and unwanted glare from the sun."*

The BRE guide considers the critical aspects of orientation and overshadowing in determining the availability of sunlight to a proposed development.

Again, these factors are of particular relevance when considering developments in urban areas, as the site in question may already be heavily overshadowed by existing surrounding buildings, or it may not be possible to orientate a new building on that site in order to ensure a south facing, or predominantly south facing, aspect due to other urban constraints

The summary of section 3.1 of the guide states as follows:

> *"In general, a dwelling or non-domestic building which has a particular requirement for sunlight, will appear reasonably sunlit provided that:*
>
> - *At least one main window faces within 90 degrees due south;*
>
> *And*
>
> - *On this window wall, all points on a line two metres above ground level are within four metres (measured sideways) of a point which receives at least a quarter of Annual Probable Sunlight Hours including at least 5% of Annual Probable Sunlight Hours during the winter months, between 21 September and 21 March.*
>
> *Clearly where the actual windows within a proposed scheme are known these can be taken as the points for assessment, rather than the two metre line above ground level as referred to above."*

3.3. Overshadowing

The BRE guidance in respect of overshadowing of amenity spaces is set out in section 3.3 of the handbook. Here it states as follows:

> *"Sunlight in the spaces between buildings has an important impact on the overall appearance and ambiance of a development. It is valuable for a number of reasons:*
>
> - *To provide attractive sunlit views (all year)*
> - *To make outdoor activities, like sitting out and children's play more pleasant (mainly during the warmer months)*
> - *To encourage plant growth (mainly in spring and summer)*
> - *To dry out the ground, reducing moss and slime (mainly during the colder months)*
> - *To melt frost, ice and snow (in winter)*
> - *To dry clothes (all year)"*

Again, it must be acknowledged that in urban areas the availability of sunlight on the ground is a factor which is significantly controlled by the existing urban fabric around the site in question and so may have very little to do with the form of the development itself. Likewise there may be many other urban design, planning and site constraints which determine and run contrary to the best form, siting and location of a proposed development in terms of availability of sun on the ground.

The summary of section 3.3 of the guide states as follows:

> *"3. 3 .17 It is recommended that for it to appear adequately sumlit throughout the year, at least half of a garden or amenity area should reteive at least two-*

hours of sunlight on 21 March. If as a result of new development an existing garclen or amenity area does not meet the above, and the area which can receive two hours of sun on 21 March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable. If a detailed calculation cannot becarried out, it is recommended that the centre of the area should receive at east two hours of sunlight on 21 March."

3.4. Further relevant information

Further information can be found in *The Daylight in Urban Areas Design Guide* (Energy Saving Trust CE257, 2007) which provides the following recommendation with regards to VSC levels in urban areas:

"If 'theta' (Visible sky angle) is greater than 65º (obstruction angle less than 25ºor VSC at least 27 percent) conventional window design will usually give reasonable results.

If 'theta' is between 45º and 65º(obstruction angle between 25º and 45º, VSC between 15 and 27 percent), special measures such as larger windows and changes to room layout are usually needed to provide adequate daylight.

If 'theta' is between 25º and 45º (obstruction angle between 45º and 65º, VSC from 5 to15 percent.), it is very difficult to provide adequate daylight unless very large windows are used.

If 'theta' is less than 25º (obstruction angle more than 65º, VSC less than 5 percent) it is often impossible to achieve reasonable daylight, even if the whole window wall is glazed."

4. Methodology

In order to undertake the daylight and sunlight assessments set out above, and in accordance with your instructions, we have prepared a three dimensional computer model and used specialist lighting simulation software.

The three dimensional representation of the proposed development has been modelled using the scheme drawings provided to us by MAKE Architects and AHMM Architects. This has been placed in the context of its surrounding buildings which have been modelled from survey information, photogrammetry, OS and site photographs. This allows for a precise model, which in turn ensures that analysis accurately represents the amount of daylight and sunlight available to the building facades, internal and external spaces, considering all of the surrounding obstructions and orientation.

4.1. Simulation assumptions

Where no values for reflectance, transmittance and maintenance factor were specified by the designer the following values from *BS 8206-2:2008, Annex A, tables A.1-A.6* were used for the calculation Average Daylight Factor values:

Reflectance values

Surrounding	0.2
Pavement	0.2
Internal walls (light grey)	0.68
Internal ceiling (white paint)	0.85
Internal floor (medium to light veneer)	0.3

Transmittance values:

Double glazing: Pilkington K Glass 4/16/4 Argon filled 90% (Tv=0.75)	0.75
Single glazing: Pilkington Optifloat Clear, Annealed, 4mm (Tv=0.90)	0.90

Maintenance factors

Vertical glazing	0.92
Horizontal glazing	0.76
Framing factor	0.8

5. Sources of information

Internal References:
IR76-80_2801

6. Conclusions on Daylight and Sunlight

6.1. Conclusions on Daylight

The internal daylight assessments undertaken have shown that 475 (93%) of the 512 habitable residential rooms within the proposed Camden Lock Village development meet or exceed the recommended levels of Average Daylight Factor (ADF), the most detailed daylight assessment.

The 37 rooms falling short are spread across the site as follows:

Block	no. of rooms below recommended level of ADF
C1	15
C2	7
D	11
W & X	4

The predominant reasons for rooms falling short include the close proximity of the viaduct to much of the site, the close proximity of blocks to each other in some areas of the site and the provision of private amenity in the form of balconies. All the above lower the level of sky visibility at the affected windows and hence a lower level of daylight ingress is seen to the room behind.

Here it should be noted that the scheme has been designed alongside GIA in order to achieve the best daylighting solution across the site's residential elements. Where possible, this has led to the majority of non-compliant rooms achieving levels marginally below those recommended and being bedrooms located within apartments where the occupants are able to enjoy good levels of daylight elsewhere; such as in the main habitable living room.

Where a kitchen is included within the room, the recommended level of ADF increases to 2%. There are a few rooms (such as that identified as 308 in figure 17) which, although exceeding the 1.5% recommended for Living Rooms, fall short of 2% Kitchen recommendation. In these cases, care has been taken so as to direct the daylight to where it is most needed; such as the kitchen worktops.

Overall we consider the development to work very well in terms of daylight considering the dense urban context.

6.2. Conclusion on Sunlight

All windows within 90 degrees of due south have been assessed for Annual Probable Sunlight Hours (APSH) and the results can be seen in figures 27-42.

With the exception of a few areas, all windows not located behind balconies meet or exceed the 25% total and 5% winter APSH recommended by the BRE. It is expected that, where balconies have been designed, lower levels of daylight and sunlight will be recorded on the windows directly behind and below During the summer months, when sunlight is most appreciated, the private balconies are expected to be utilised in order to enjoy direct sunlight. Where lower values can be seen in the figures, these generally relate either to bedrooms which the BRE state to be of lesser importance or to windows behind and below balconies.

6.3. Summary

The proposed Camden Lock Village development will provide additional residential accodomation which over all will have good levels of daylight and sunlight. Where an individual room or window has fallen short of the daylight levels recommended by the BRE and the British Standard, they have been commented on in Sections 6.1 and 6.2 above.

Overall, 93% of all rooms within the proposed development will achieve daylighting levels which meet or exceed those recommended by the BRE and BS and so we consider the development to be acceptable in terms of daylight and sunlight.

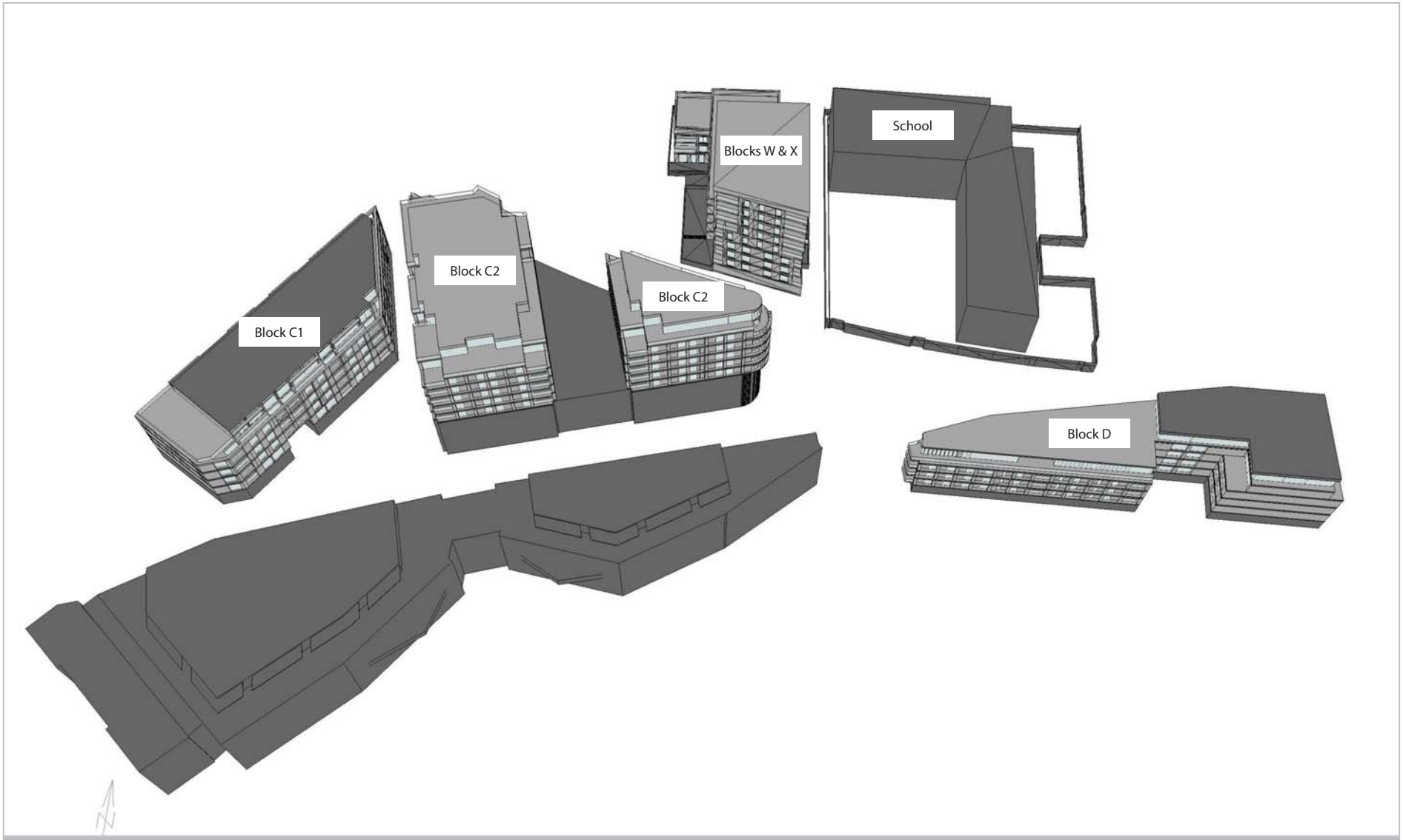


Figure 1: Perspective Overview

Internal Daylight Assessments

Room No.		Daylight Quantum ADF%	Distribution of Daylight NSL%	RDC
Blocks W & X - Ground Floor				
0	L/K/D	1.4	69	Met
1	Bedroom	1.4	89	Met
2	Bedroom	1.5	96	Met
3	L/K/D	1.7	82	Met
4	Bedroom	1	82	Met
5	L/K/D	2.3	91	Met
6	Bedroom	1.1	85	Met
7	Bedroom	1.5	71	Met
8	L/K/D	2.3	100	Met
9	L/K/D	2.2	94	Met
10	Bedroom	2.4	96	Met

Table 1: Assessment Data

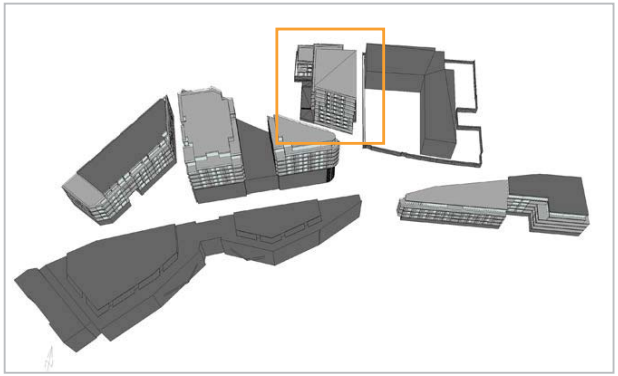


Figure 2: Plan View

Room No.		Daylight Quantum ADF%	Distribution of Daylight NSL%	RDC
Blocks W & X - First Floor				
11	Living Room	2.9	100	N/A
12	Bedroom	1.4	93	Met
13	Bedroom	1.2	97	Met
14	Bedroom	1.1	96	Met
15	Bedroom	1.6	97	Met
16	L/K/D	2.3	100	N/A
17	L/K/D	1.5	99	N/A
18	Bedroom	1.5	74	N/A
19	Bedroom	1.4	98	Met
20	Bedroom	1.2	98	Met
21	Bedroom	1.5	98	Met
22	Living Room	2.6	98	Met
23	Bedroom	1.9	67	Met
24	Living Room	2.1	96	Met
25	Bedroom	2.2	92	N/A
26	Living Room	1.7	92	Met
27	Kitchen	2.9	98	Met
28	Bedroom	1.6	98	Met
29	Bedroom	2.8	100	Met
30	L/K/D	3.8	99	N/A

Table 2: Assessment Data

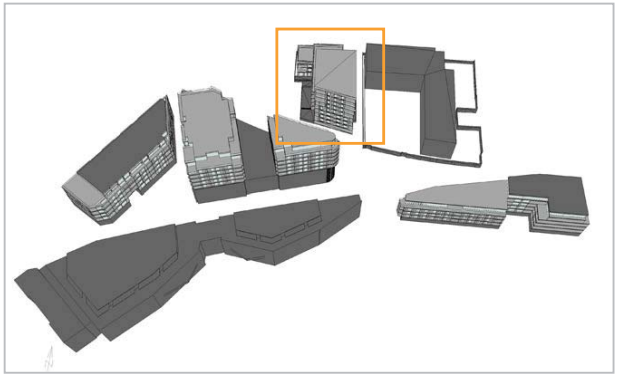


Figure 3: Plan View

Room No.		Daylight Quantum ADF%	Distribution of Daylight NSL%	RDC
Blocks W & X - Second Floor				
31	L/K/D	2	100	N/A
32	Bedroom	1.7	82	N/A
33	Bedroom	1.9	96	Met
34	Bedroom	2.2	96	Met
35	Bedroom	1.8	98	Met
36	Living Room	3.3	98	Met
37	Living Room	4.7	100	Met
38	Kitchen	1.6	98	Met
39	Bedroom	2.6	94	N/A
40	L/K/D	3	100	Met
41	Bedroom	2.6	96	Met
42	Bedroom	1.7	98	Met
43	Bedroom	3	99	Met
44	L/K/D	4.5	100	N/A
45	Bedroom	2.3	79	Met
46	Bedroom	1.7	90	Met
47	Bedroom	1	85	Met
48	Living Room	1.9	96	N/A
49	Bedroom	1.9	96	Met
50	Bedroom	2	94	Met
51	Bedroom	2.1	96	Met
52	Bedroom	2	97	N/A
53	L/K/D	2.9	100	N/A

Table 3: Assessment Data

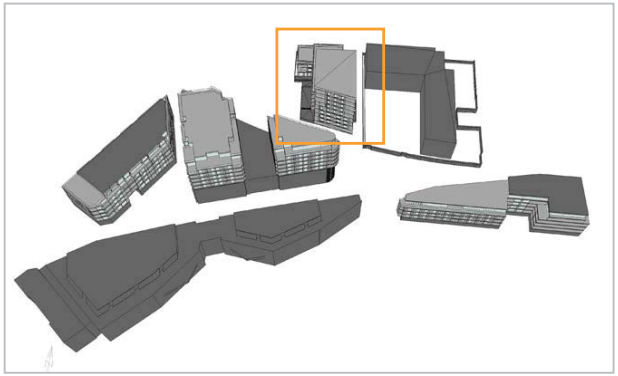


Figure 4: Plan View

Room No.		Daylight Quantum ADF%	Distribution of Daylight NSL%	RDC
Blocks W & X - Third Floor				
54	L/K/D	2.3	100	N/A
55	Bedroom	1.9	88	N/A
56	Bedroom	2	96	Met
57	Bedroom	2.3	96	Met
58	Bedroom	1.9	98	Met
59	Living Room	3.6	98	Met
60	Living Room	5.2	100	Met
61	Kitchen	2.2	98	N/A
62	Bedroom	2.2	96	Met
63	L/K/D	4.4	100	N/A
64	Bedroom	2.7	99	Met
65	Bedroom	2.1	96	Met
66	Bedroom	1.2	96	Met
67	L/K/D	2.3	97	N/A
68	Bedroom	2.1	96	Met
69	Bedroom	2.2	94	Met
70	Bedroom	2.2	96	Met
71	Bedroom	2.1	97	Met
72	L/K/D	3.3	100	N/A

Table 4: Assessment Data

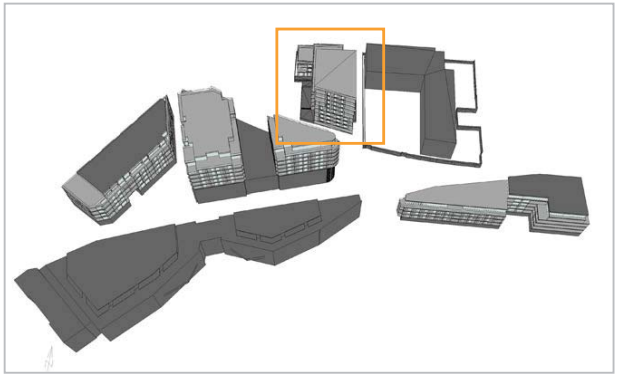
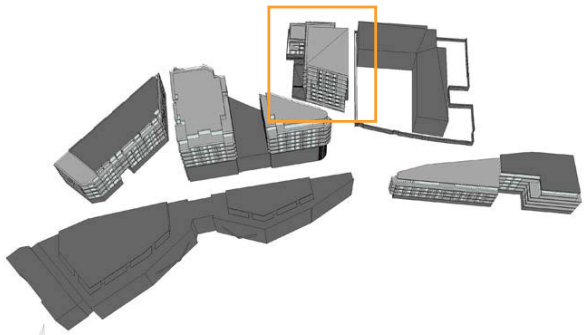


Figure 5: Plan View

Room No.		Daylight Quantum ADF%	Distribution of Daylight NSL%	RDC
Blocks W & X - Fourth Floor				
73	L/K/D	2.9	98	N/A
74	Bedroom	1.3	79	Met
75	Bedroom	1.3	60	Met
76	L/K/D	2.2	88	N/A
77	Bedroom	2.1	96	Met
78	Bedroom	2.5	93	N/A
79	L/K/D	4	100	N/A
80	L/K/D	3.4	99	N/A
81	Bedroom	2.5	97	N/A
82	Bedroom	2.4	96	Met
83	Bedroom	2.2	95	Met
84	Bedroom	2.3	97	Met

Table 5: Assessment Data



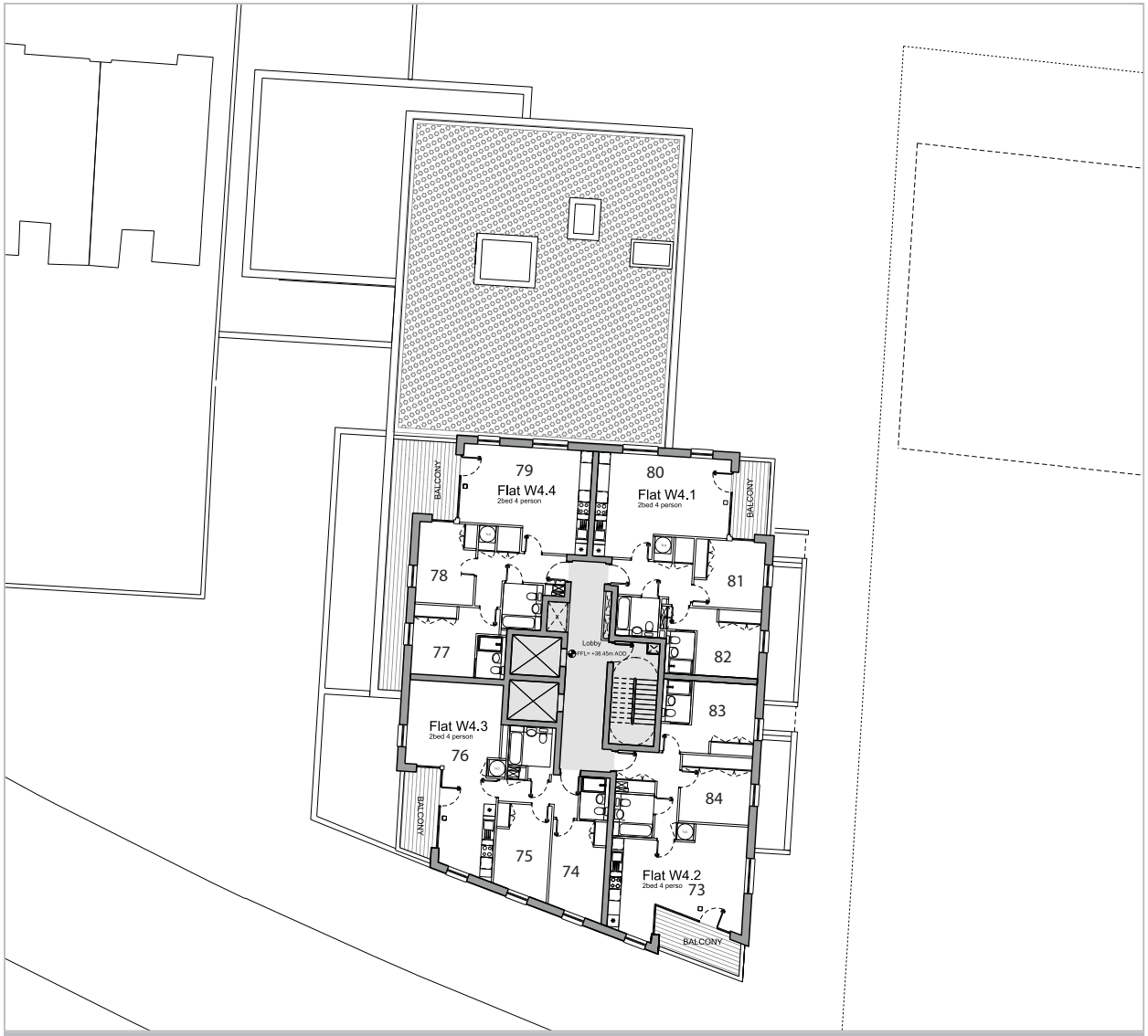
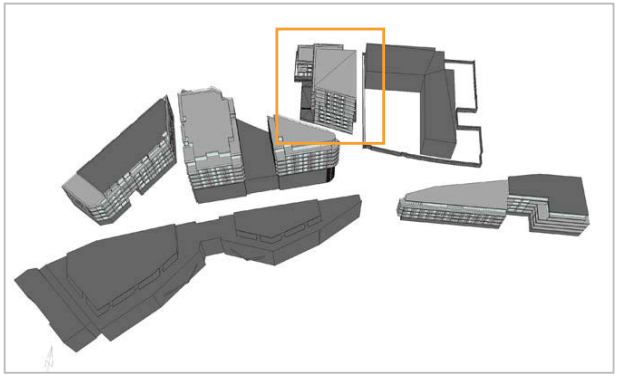


Figure 6: Plan View

Room No.		Daylight Quantum ADF%	Distribution of Daylight NSL%	RDC
Blocks W & X - Fifth Floor				
85	L/K/D	2.8	96	N/A
86	Bedroom	2.3	96	Met
87	Bedroom	2.5	94	N/A
88	L/K/D	3.9	100	N/A
89	L/K/D	3.5	99	N/A
90	Bedroom	2.6	97	N/A
91	Bedroom	2.4	96	Met
92	Bedroom	2.2	95	Met
93	Bedroom	2.3	97	Met
94	L/K/D	2.9	98	N/A
95	Bedroom	1.4	82	Met
96	Bedroom	1.8	84	N/A

Table 6: Assessment Data



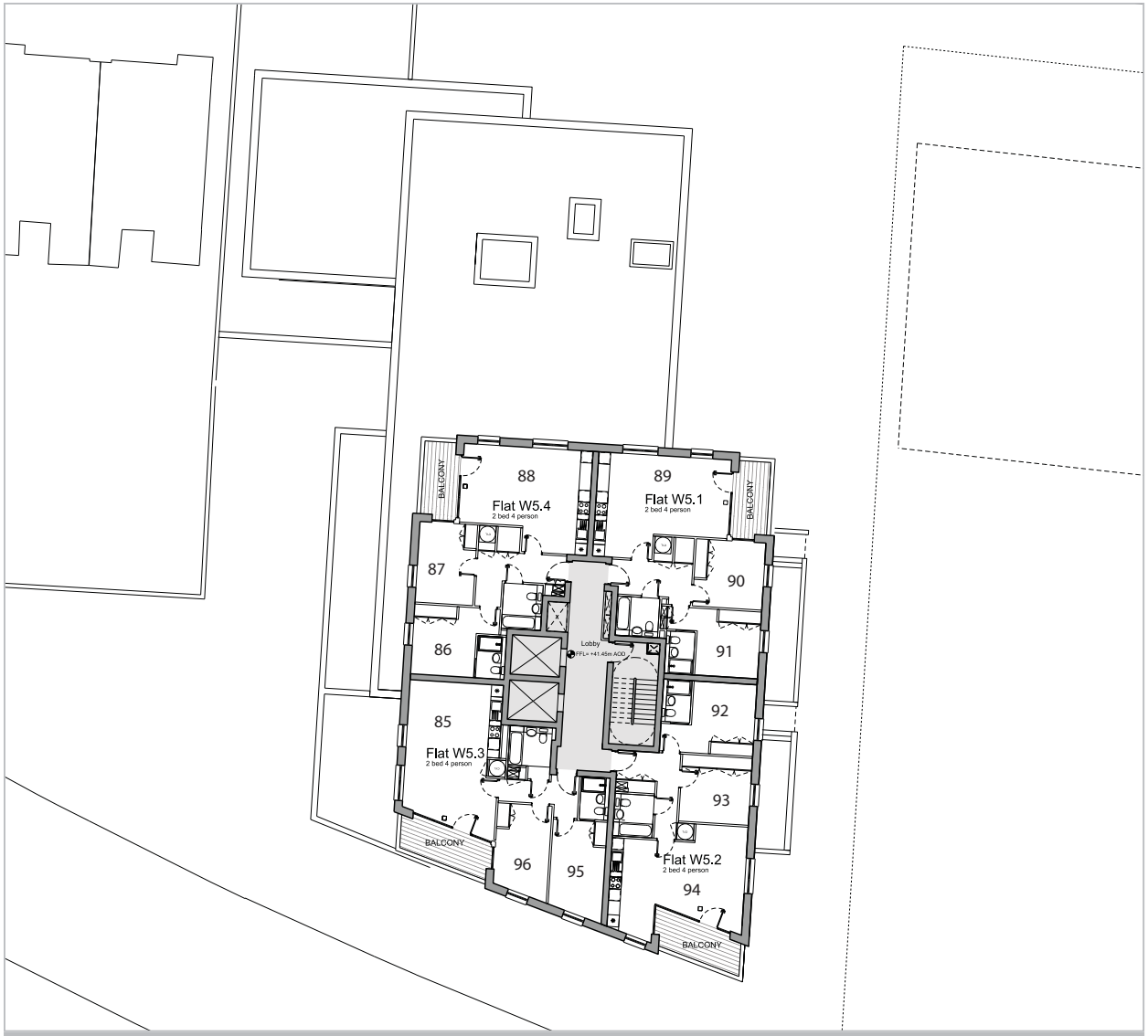
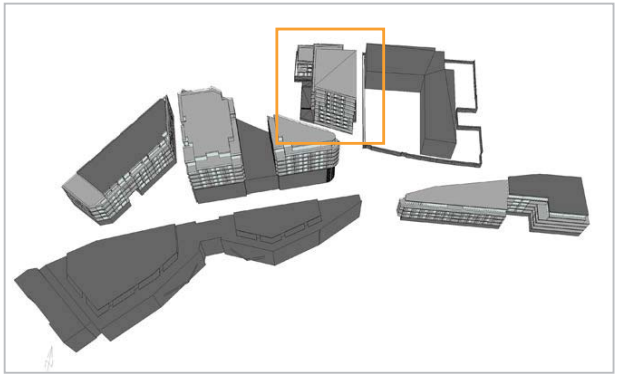


Figure 7: Plan View

		Daylight Quantum	Distribution of Daylight	
Room No.		ADF%	NSL%	RDC
Blocks W & X - Sixth Floor				
97	L/K/D	2.9	100	N/A
98	Bedroom	2.3	96	Met
99	Bedroom	2.5	94	N/A
100	L/K/D	3.9	100	N/A
101	L/K/D	3.5	99	N/A
102	Bedroom	2.6	97	N/A
103	Bedroom	2.4	96	Met
104	Bedroom	2.2	95	Met
105	Bedroom	2.3	97	Met
106	L/K/D	3	99	N/A
107	Bedroom	1.5	87	Met
108	Bedroom	2	91	N/A

Table 7: Assessment Data



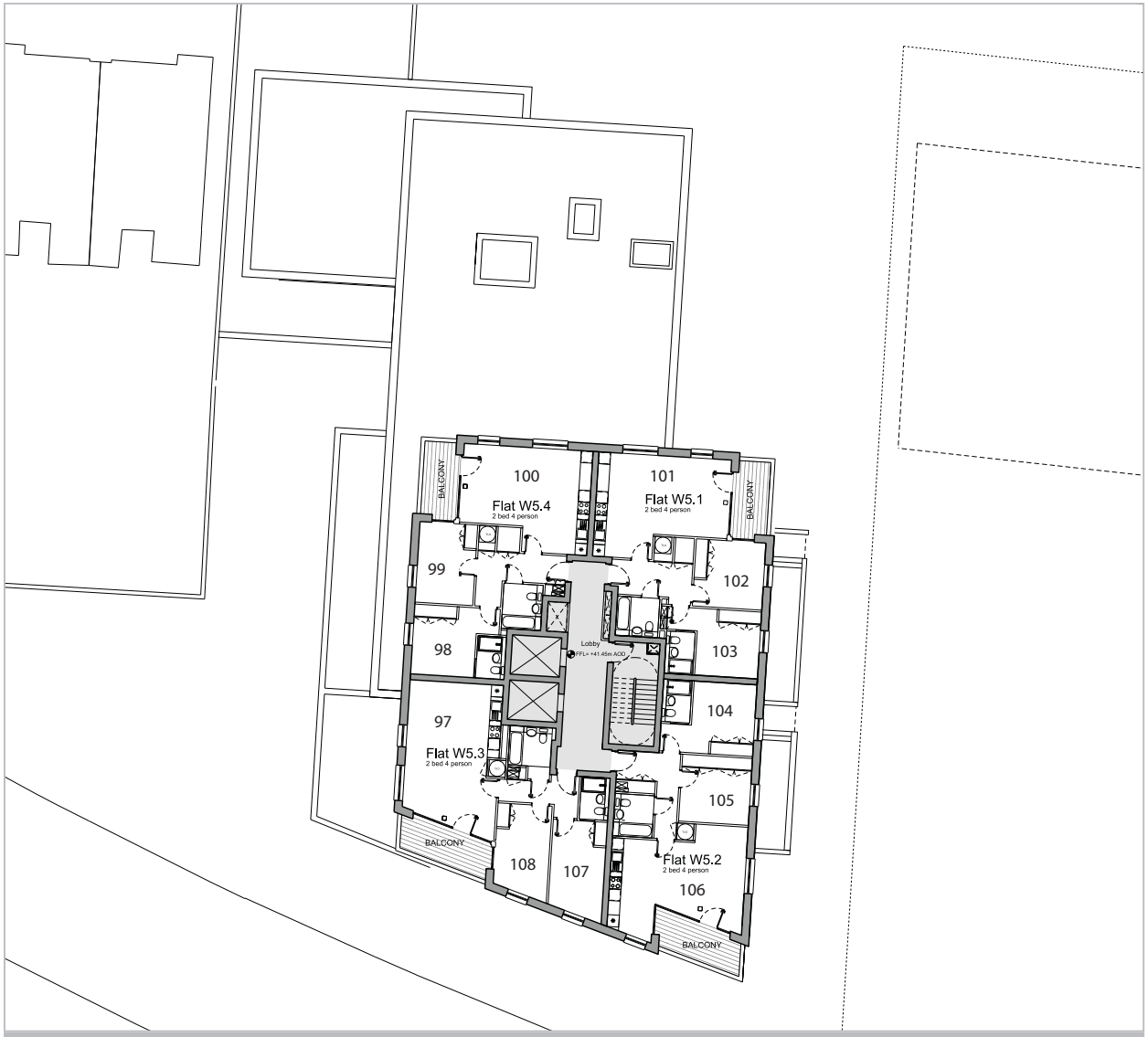
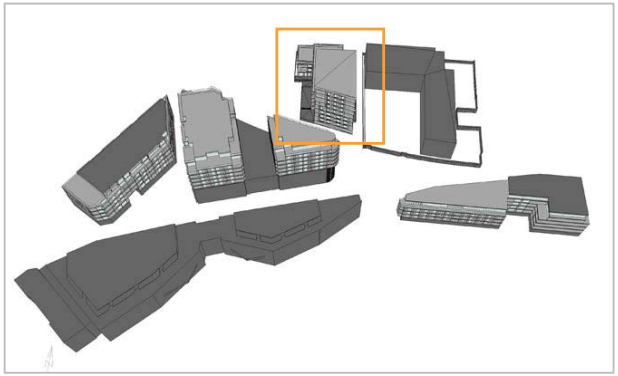


Figure 8: Plan View

	Daylight Quantum		Distribution of Daylight	
Room No.		ADF%	NSL%	RDC
Blocks W & X - Seventh Floor				
109	L/K/D	3.1	100	N/A
110	Bedroom	2.3	96	Met
111	Bedroom	2.6	94	N/A
112	L/K/D	2.8	100	N/A
113	L/K/D	3.4	99	N/A
114	Bedroom	2.6	97	N/A
115	Bedroom	2.4	96	Met
116	Bedroom	2.2	95	Met
117	Bedroom	2.3	97	Met
118	L/K/D	3.1	99	N/A
119	Bedroom	1.6	95	Met
120	Bedroom	2.2	98	N/A

Table 8: Assessment Data



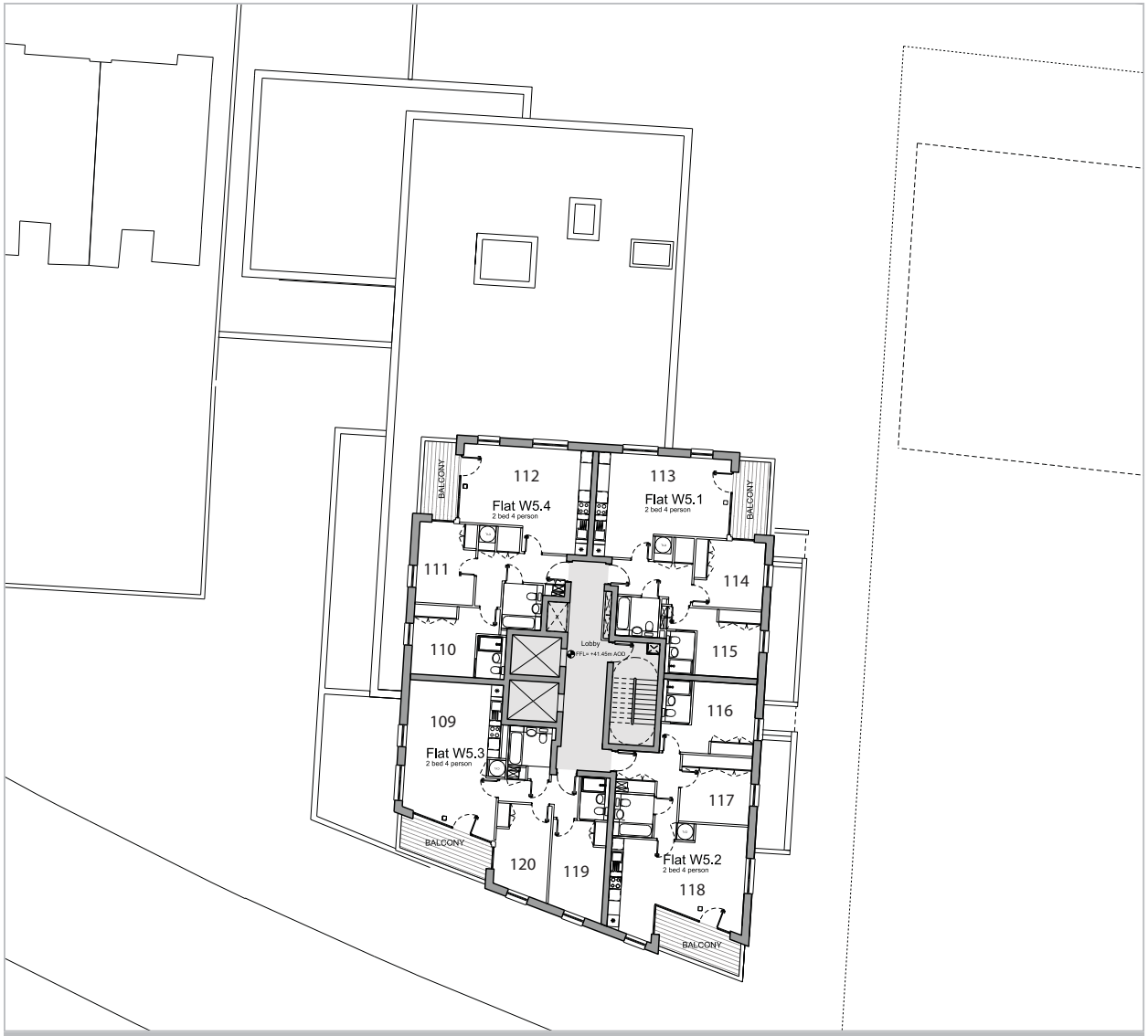
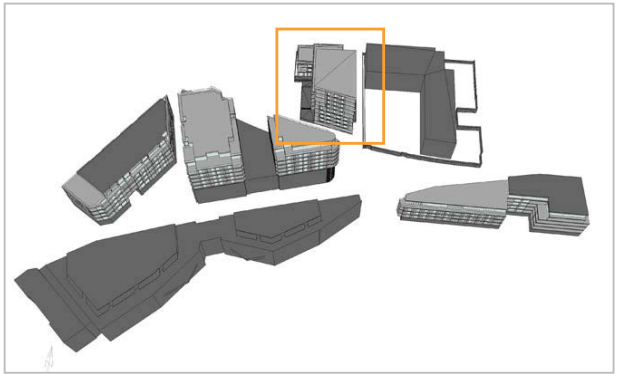


Figure 9: Plan View

		Daylight Quantum	Distribution of Daylight	
Room No.		ADF%	NSL%	RDC
Blocks W & X - Eighth Floor				
121	L/K/D	3.1	100	N/A
122	Bedroom	2.3	96	Met
123	Bedroom	2.4	94	N/A
124	L/K/D	3.5	100	N/A
125	L/K/D	3.3	99	N/A
126	Bedroom	2.5	97	N/A
127	Bedroom	2.4	96	Met
128	Bedroom	2.2	95	Met
129	Bedroom	2.3	97	Met
130	L/K/D	3.1	99	N/A
131	Bedroom	1.7	97	Met
132	Bedroom	2.3	98	N/A

Table 9: Assessment Data



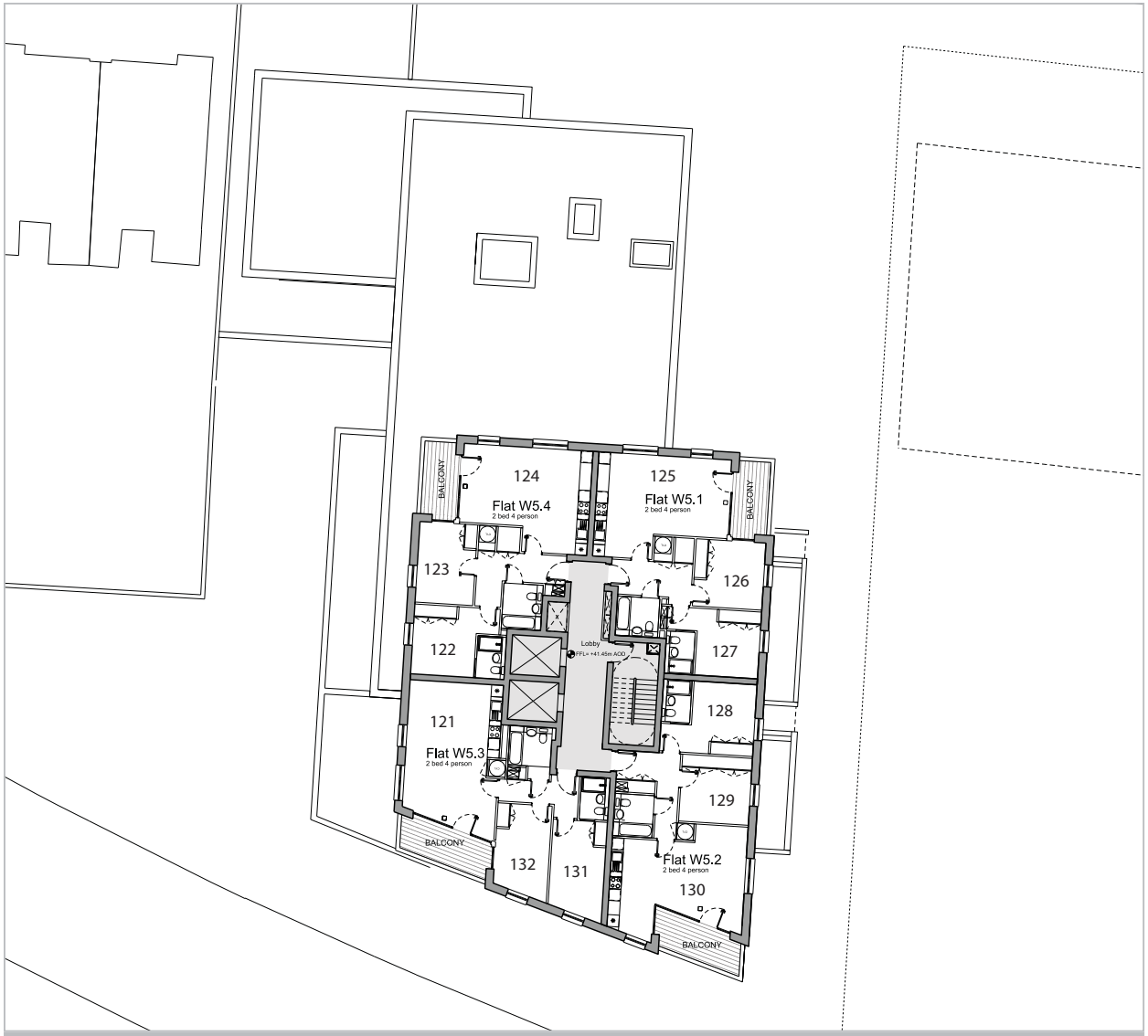


Figure 10: Plan View

Room No.		Daylight Quantum ADF%	Distribution of Daylight NSL%	RDC
Block C1 - Level 01				
133	Living Room	2.3	97	Met
134	Living Room	2.8	99	N/A
135	Bedroom	2.1	99	Met
136	Bedroom	3.7	99	N/A
137	Living Room	3	99	Met
138	Bedroom	3.8	98	Met
139	Bedroom	2.2	100	Met
140	L/K/D	2.7	99	N/A
141	Living Room	3	99	N/A
142	Bedroom	2	100	Met
143	Bedroom	4.1	98	N/A
144	Bedroom	3.8	99	Met
145	Bedroom	4.6	98	Met
146	Living Room	2.9	99	N/A
147	Bedroom	0.1	30	N/A
148	Bedroom	0.7	68	Met
149	Living Room	1.3	80	N/A
150	L/K/D	1.4	88	N/A
151	Bedroom	1.2	100	Met
152	Bedroom	3.5	99	Met
153	Living Room	2.4	98	Met
154	Living Room	2.5	91	Met
155	Bedroom	2	92	Met
156	Bedroom	0.8	76	Met
157	Bedroom	1.3	58	Met

Table 10: Assessment Data

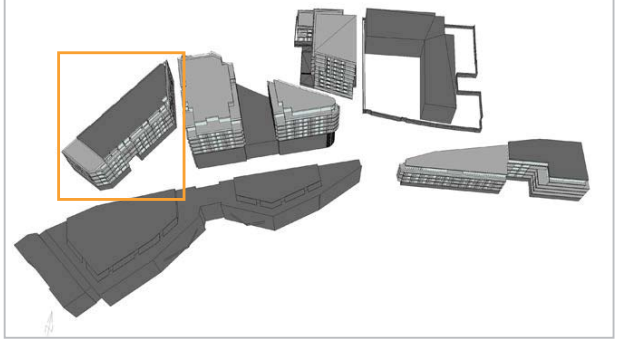


Figure 11: Plan View

		Daylight Quantum	Distribution of Daylight	
Room No.		ADF%	NSL%	RDC
Block C1 - Level 02				
158	Living Room	2.3	97	Met
159	Living Room	2.9	99	N/A
160	Bedroom	2.2	100	Met
161	Living Room	2.8	99	N/A
162	Bedroom	2	100	Met
163	L/K/D	1.4	100	Met
164	Bedroom	3.6	99	Met
165	Bedroom	4.5	99	Met
166	Bedroom	2.3	100	Met
167	L/K/D	2.8	99	N/A
168	Living Room	3.2	99	N/A
169	Bedroom	2.1	100	Met
170	Bedroom	4.2	98	N/A
171	Bedroom	3.9	99	Met
172	Bedroom	4.6	98	Met
173	Living Room	3.1	99	N/A
174	Bedroom	0.2	43	N/A
175	Bedroom	0.8	75	Met
176	Living Room	1.4	84	N/A
177	L/K/D	1.6	92	N/A
178	Bedroom	1.3	100	Met
179	Bedroom	2.8	98	Met
180	Bedroom	2.4	98	N/A
181	L/K/D	0.8	100	Met
182	Bedroom	1.1	100	Met
183	Bedroom	2.4	99	N/A
184	Living Room	1.9	96	Met
185	Bedroom	1.2	94	Met
186	Bedroom	2	80	Met

Table 11: Assessment Data

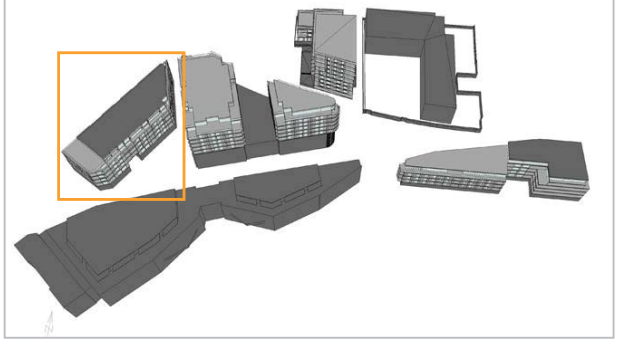


Figure 12: Plan View

		Daylight Quantum	Distribution of Daylight	
Room No.		ADF%	NSL%	RDC
Block C1 - Level 03				
187	Living Room	2.4	97	Met
188	Living Room	3	99	N/A
189	Bedroom	2.3	100	Met
190	Living Room	2.9	99	N/A
191	Bedroom	2	100	Met
192	L/K/D	1.4	100	Met
193	Bedroom	3.7	99	Met
194	Bedroom	3.7	98	Met
195	Bedroom	2.3	100	Met
196	L/K/D	2.5	99	N/A
197	Living Room	3.1	96	N/A
198	Bedroom	2.1	100	Met
199	Bedroom	4.2	98	N/A
200	Bedroom	3.9	99	Met
201	Bedroom	4.7	98	Met
202	Living Room	3.2	100	N/A
203	Bedroom	0.2	59	N/A
204	Bedroom	1	85	Met
205	Living Room	1.6	85	N/A
206	L/K/D	1.8	92	N/A
207	Bedroom	1.5	100	Met
208	Bedroom	3.1	98	Met
209	Bedroom	2.7	99	N/A
210	L/K/D	0.9	100	Met
211	Bedroom	1.3	100	Met
212	Bedroom	2.8	99	N/A
213	Living Room	2.2	99	Met
214	Bedroom	1.7	100	Met
215	Bedroom	2.5	95	Met

Table 12: Assessment Data

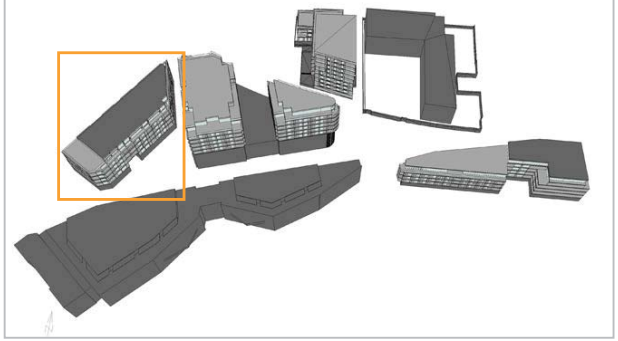


Figure 13: Plan View

Room No.		Daylight Quantum ADF%	Distribution of Daylight NSL%	RDC
Block C1 - Level 04				
216	Living Room	2.3	97	Met
217	Living Room	3.5	100	N/A
218	Bedroom	5.8	100	Met
219	Living Room	3.4	100	N/A
220	Bedroom	4.6	100	Met
221	L/K/D	2.6	100	Met
222	Bedroom	4.2	100	Met
223	Bedroom	3.6	98	Met
224	Bedroom	5.8	100	Met
225	L/K/D	3.3	100	N/A
226	Living Room	3.9	100	N/A
227	Bedroom	5.6	100	Met
228	Bedroom	5.1	100	N/A
229	Bedroom	3.8	99	Met
230	Bedroom	4.5	98	Met
231	Living Room	5.2	100	N/A
232	Bedroom	1.9	84	N/A
233	Bedroom	3.2	92	Met
234	Living Room	2.1	89	N/A
235	L/K/D	2.3	93	N/A
236	Bedroom	4.1	100	Met
237	Bedroom	3.3	98	Met
238	Bedroom	3.3	100	N/A
239	L/K/D	2.2	100	Met
240	Bedroom	3.6	100	Met
241	Bedroom	3.6	100	N/A
242	Living Room	2.4	99	Met
243	Bedroom	4.6	100	Met
244	Bedroom	2.9	95	Met

Table 13: Assessment Data

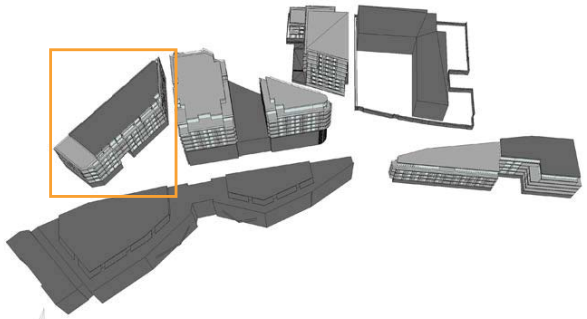


Figure 14: Plan View

Room No.		Daylight Quantum ADF%	Distribution of Daylight NSL%	RDC
Block C1 - Level 05				
245	L/K/D	2.2	99	Met
246	Bedroom	4.9	100	Met
247	Bedroom	5.2	100	Met
248	Bedroom	7.1	100	Met
249	L/K/D	4	100	Met
250	L/K/D	3.8	100	N/A
251	Bedroom	6.2	100	Met
252	Bedroom	4.4	100	Met
253	L/K/D	4.4	100	Met
254	Bedroom	4.4	100	Met
255	Bedroom	2.5	90	N/A
256	Bedroom	4.2	92	Met
257	L/K/D	2.5	100	Met
258	L/K/D	3.7	100	Met
259	Bedroom	6.5	100	Met
260	Bedroom	5.2	100	Met
261	L/K/D	4.7	100	Met
262	Bedroom	5.3	100	Met
263	Bedroom	7.6	100	Met
264	L/K/D	3.4	100	Met

Table 14: Assessment Data

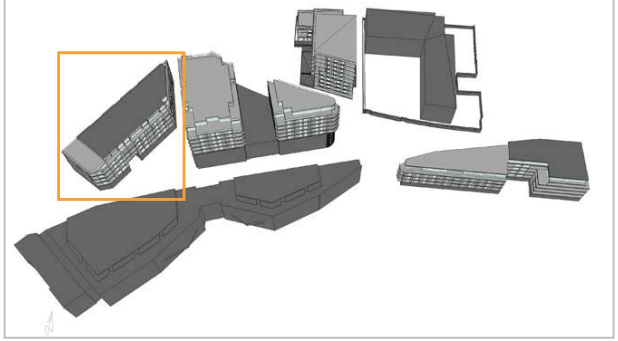
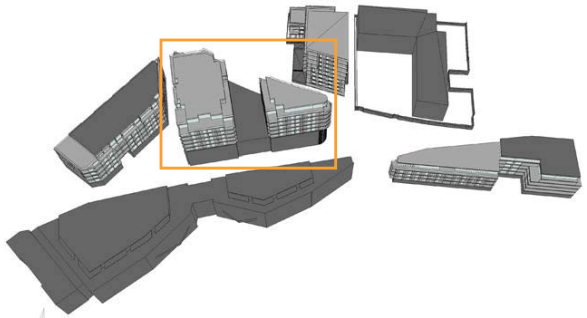


Figure 15: Plan View

Room No.		Daylight Quantum ADF%	Distribution of Daylight NSL%	RDC
Block C2 - Level 03				
265	L/K/D	5	100	N/A
266	Bedroom	1.2	56	Met
267	Bedroom	1.6	54	Met
268	Bedroom	1.7	63	Met
269	Bedroom	1.4	48	Met
270	Bedroom	1.8	92	Met
271	L/K/D	1.1	81	N/A
272	L/K/D	2	96	Met
273	Bedroom	1.5	100	Met
274	Bedroom	2.3	98	Met
275	L/K/D	3.2	100	N/A
276	Bedroom	2.1	99	Met
277	Bedroom	2.1	99	Met
278	L/K/D	2.7	100	N/A
279	Bedroom	1.5	64	Met
280	Bedroom	1.7	86	Met
281	Bedroom	1.9	68	Met
282	Living Room	1.4	100	N/A
283	Bedroom	5.1	100	N/A
284	L/K/D	2.5	99	N/A
285	L/K/D	2.6	100	N/A
286	L/K/D	2.2	100	N/A
287	Bedroom	2.9	96	Met
288	Bedroom	1.8	94	Met
289	Bedroom	3.2	94	Met
290	L/K/D	3.2	100	N/A
291	Bedroom	2.9	94	Met
292	Bedroom	3.4	98	Met
293	Bedroom	3.7	99	N/A

Table 15: Assessment Data



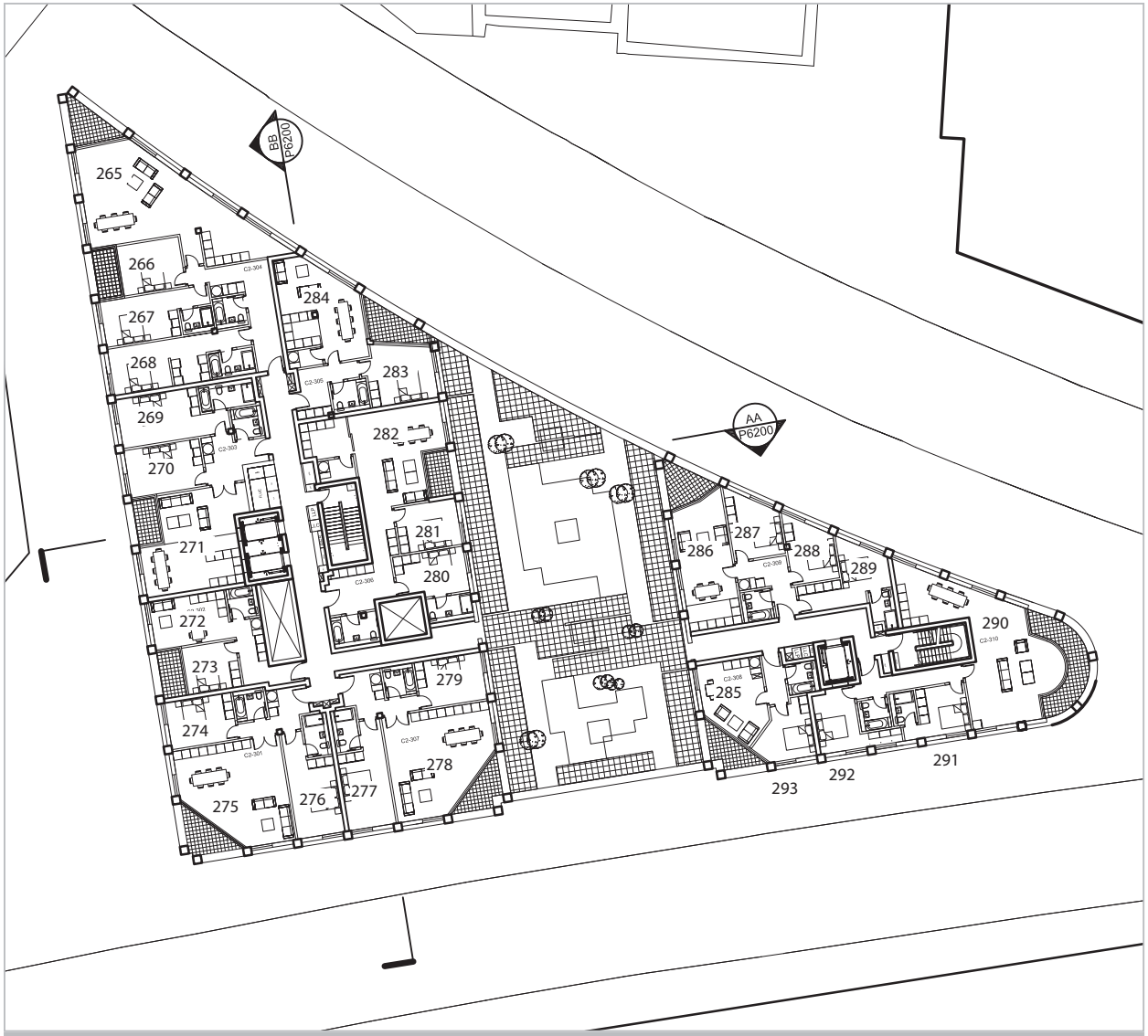


Figure 16: Plan View

Room No.		Daylight Quantum ADF%	Distribution of Daylight NSL%	RDC
Block C2 - Level 04				
294	Bedroom	2.4	98	Met
295	Bedroom	2.6	99	Met
296	Bedroom	3	99	N/A
297	L/K/D	1.8	100	N/A
298	L/K/D	2	99	N/A
299	Bedroom	1.6	100	Met
300	Bedroom	2.5	98	Met
301	L/K/D	3.5	100	N/A
302	Bedroom	2.2	99	Met
303	Bedroom	2.2	99	Met
304	L/K/D	3.1	100	N/A
305	Bedroom	2.1	62	Met
306	Bedroom	1.5	38	Met
307	Bedroom	2.2	55	Met
308	L/K/D	1.6	99	N/A
309	Living Room	1.8	81	Met
310	Bedroom	2.5	88	Met
311	Bedroom	2.4	100	Met
312	L/K/D	5.3	100	N/A
313	L/K/D	3.5	100	N/A
314	Bedroom	3	92	Met
315	Bedroom	3.6	98	Met
316	L/K/D	3.7	100	N/A
317	Bedroom	2.2	43	Met
318	Bedroom	2	40	Met
319	L/K/D	3.7	100	N/A
320	Bedroom	2.2	91	Met
321	Bedroom	3.2	96	Met

Table 16: Assessment Data

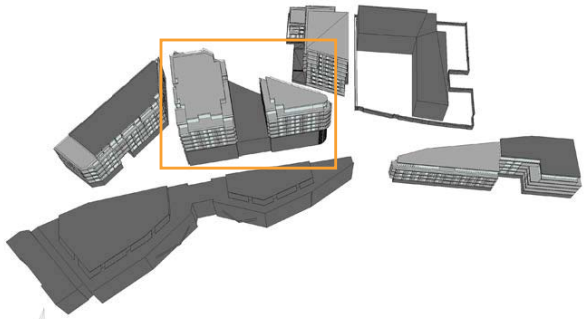


Figure 17: Plan View

Room No.		Daylight Quantum ADF%	Distribution of Daylight NSL%	RDC
Block C2 - Level 05				
322	Bedroom	2.8	98	Met
323	Bedroom	2.3	99	Met
324	Bedroom	2.6	99	N/A
325	L/K/D	2.1	100	N/A
326	L/K/D	2.2	99	N/A
327	Bedroom	1.8	100	Met
328	Bedroom	2.8	98	Met
329	L/K/D	3.8	100	N/A
330	Bedroom	2.4	99	Met
331	Bedroom	2.4	99	Met
332	L/K/D	3.4	100	N/A
333	Bedroom	2.4	73	Met
334	Bedroom	1.7	45	Met
335	Bedroom	2.6	66	Met
336	L/K/D	1.8	99	N/A
337	Living Room	2	86	Met
338	Bedroom	2.7	93	Met
339	Bedroom	2.6	100	Met
340	L/K/D	5.2	100	N/A
341	L/K/D	3.9	100	N/A
342	Bedroom	3.3	92	Met
343	Bedroom	3.7	98	Met
344	L/K/D	4	100	N/A
345	Bedroom	2.6	63	Met
346	Bedroom	2.5	60	Met
347	L/K/D	4.3	100	N/A
348	Bedroom	2.3	92	Met
349	Bedroom	3.3	98	Met

Table 17: Assessment Data

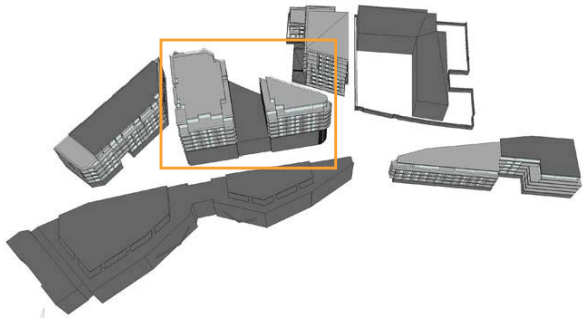


Figure 18: Plan View

Room No.		Daylight Quantum ADF%	Distribution of Daylight NSL%	RDC
Block C2 - Level 06				
350	Bedroom	2.8	98	Met
351	Bedroom	2.3	99	Met
352	Bedroom	2.6	99	N/A
353	L/K/D	1.8	100	N/A
354	L/K/D	1.7	99	N/A
355	Bedroom	1.8	100	Met
356	Bedroom	2.8	98	Met
357	L/K/D	3.8	100	N/A
358	Bedroom	2.4	99	Met
359	Bedroom	2.4	99	Met
360	L/K/D	3.5	100	N/A
361	Bedroom	2.8	92	Met
362	Bedroom	1.9	63	Met
363	Bedroom	2.9	90	Met
364	L/K/D	2	99	N/A
365	Living Room	2.1	95	Met
366	Bedroom	2.8	96	Met
367	Bedroom	2.7	100	Met
368	L/K/D	5.2	100	N/A
369	L/K/D	4	100	N/A
370	Bedroom	3.2	92	Met
371	Bedroom	3.7	98	Met
372	L/K/D	4.1	100	N/A
373	Bedroom	3	85	Met
374	Bedroom	2.9	88	Met
375	L/K/D	4.6	100	N/A
376	Bedroom	2.3	92	Met
377	Bedroom	3.5	98	Met

Table 18: Assessment Data

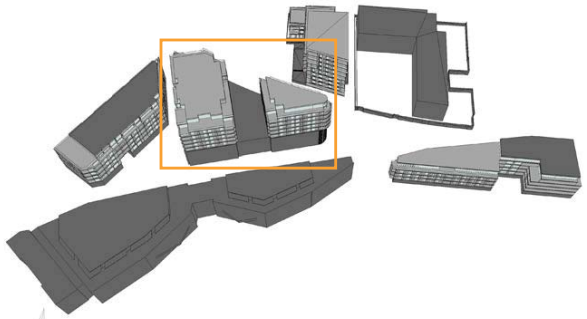


Figure 19: Plan View

Room No.		Daylight Quantum ADF%	Distribution of Daylight NSL%	RDC
Block C2 - Level 07				
378	L/K/D	5.4	100	N/A
379	Bedroom	2.5	98	Met
380	L/K/D	3.3	100	N/A
381	L/K/D	2.9	99	N/A
382	Bedroom	4.6	99	N/A
383	Bedroom	2	98	Met
384	L/K/D	7.3	100	N/A
385	L/K/D	4.6	100	N/A
386	Bedroom	7.3	100	N/A
387	Bedroom	2	97	Met
388	L/K/D	4.2	100	N/A
389	Bedroom	2.6	94	Met
390	Bedroom	2	96	Met
391	Bedroom	2.7	96	Met
392	L/K/D	5.4	100	N/A
393	L/K/D	8.6	100	N/A
394	Bedroom	1.8	94	Met
395	L/K/D	4	100	N/A
396	Bedroom	4.1	98	Met
397	L/K/D	6.5	100	N/A
398	Bedroom	3.6	97	Met

Table 19: Assessment Data

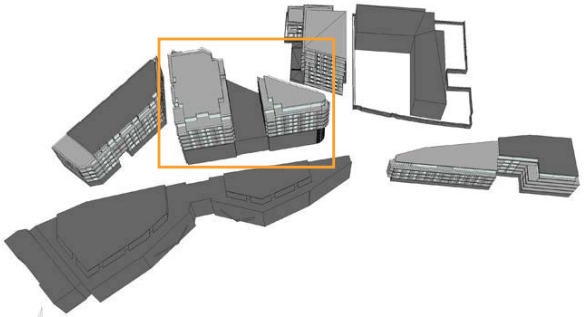
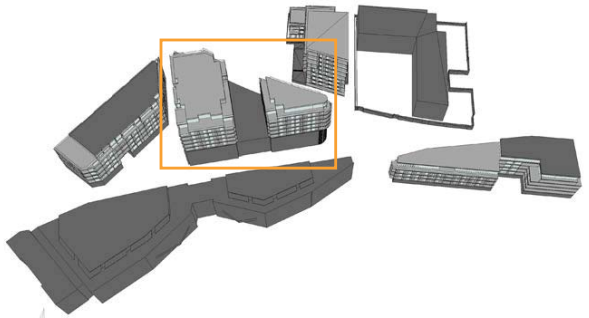


Figure 20: Plan View

Room No.		Daylight Quantum ADF%	Distribution of Daylight NSL%	RDC
Block C2 - Level 08				
399	Bedroom	7.2	100	Met
400	Bedroom	17.5	100	N/A
401	Bedroom	18.4	100	N/A
402	Bedroom	7.6	100	Met
403	Bedroom	10.8	100	N/A
404	Bedroom	12	100	Met
405	Bedroom	30.5	100	Met
406	Bedroom	11.9	100	N/A
407	Bedroom	8	100	Met
408	Bedroom	8.1	100	N/A
409	Bedroom	13.7	100	N/A
410	Bedroom	6.9	100	N/A
411	Bedroom	17	100	N/A
412	Bedroom	17	100	N/A
413	Bedroom	14.2	100	N/A

Table 20: Assessment Data



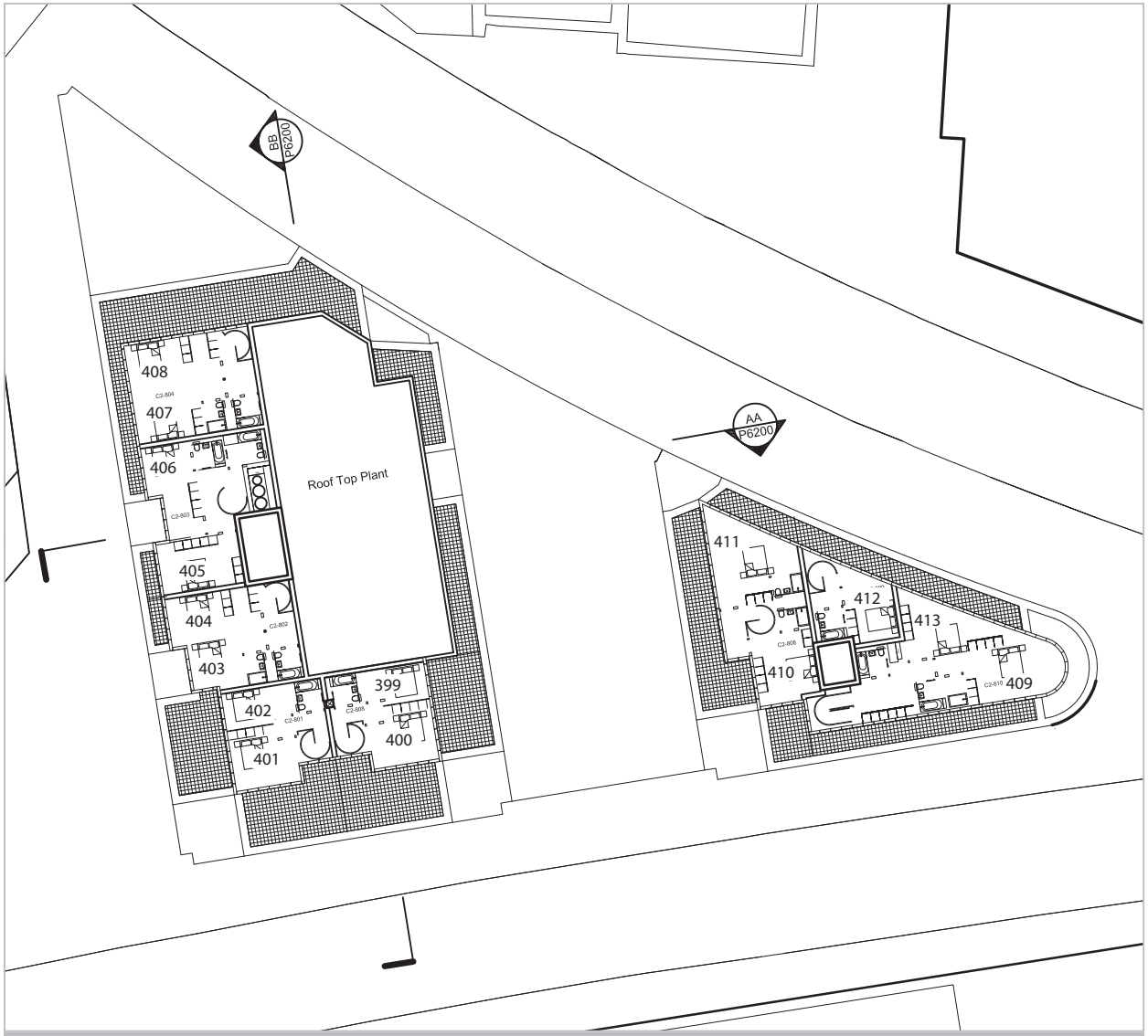


Figure 21: Plan View

Room No.		Daylight Quantum ADF%	Distribution of Daylight NSL%	RDC
Block D - Level 01				
414	L/K/D	3.9	99	N/A
415	Bedroom	0.6	61	Met
416	Bedroom	0.7	30	N/A
417	Bedroom	1	43	Met
418	Bedroom	1.2	53	Met
419	Bedroom	1.1	45	N/A
420	L/K/D	2.2	97	Met
421	L/K/D	2	97	Met
422	Bedroom	0.5	24	Met
423	Bedroom	0.5	23	Met
424	Bedroom	0.9	42	Met
425	Bedroom	1	62	N/A
426	L/K/D	4.1	100	Met
427	Bedroom	3.4	100	Met
428	Bedroom	4.9	100	N/A
429	L/K/D	2.1	100	N/A
430	L/K/D	1.1	66	Met
431	Bedroom	2.9	87	N/A
432	Bedroom	2.8	99	N/A
433	L/K/D	2.2	98	N/A
434	L/K/D	1.7	98	Not Met
435	L/K/D	2.7	98	N/A
436	Bedroom	2.3	96	Met
437	Bedroom	2.9	96	Met

Table 21: Assessment Data

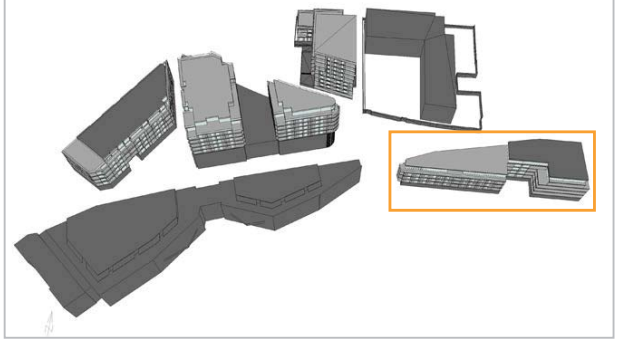


Figure 22: Plan View

Room No.		Daylight Quantum ADF%	Distribution of Daylight NSL%	RDC
Block D - Level 02				
438	L/K/D	4.9	100	N/A
439	Bedroom	1.3	98	Met
440	Bedroom	1.9	99	N/A
441	Bedroom	2.5	98	Met
442	Bedroom	3.2	99	Met
443	Bedroom	3.1	97	N/A
444	L/K/D	2.7	98	Met
445	L/K/D	2.6	100	Met
446	Bedroom	1.5	99	Met
447	Bedroom	1.4	98	Met
448	Bedroom	2.2	99	Met
449	Bedroom	1.9	98	N/A
450	L/K/D	4.6	100	Met
451	Bedroom	3.6	100	Met
452	Bedroom	5	100	N/A
453	L/K/D	2.2	100	N/A
454	L/K/D	1.2	72	Met
455	Bedroom	3.4	94	N/A
456	Bedroom	3.1	99	N/A
457	L/K/D	2.3	98	N/A
458	L/K/D	1.8	98	Not Met
459	L/K/D	2.8	98	N/A
460	Bedroom	2.3	96	Met
461	Bedroom	3	96	Met

Table 22: Assessment Data

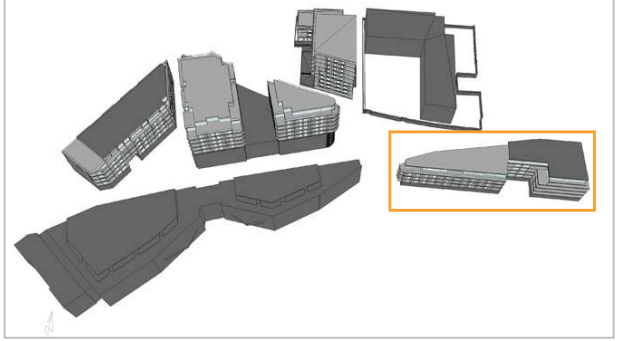


Figure 23: Plan View

		Daylight Quantum	Distribution of Daylight	
Room No.		ADF%	NSL%	RDC
Block D - Level 03				
462	L/K/D	5.4	100	N/A
463	Bedroom	1.8	99	Met
464	Bedroom	2.7	99	N/A
465	Bedroom	3.3	99	Met
466	Bedroom	4.4	100	Met
467	Bedroom	4.3	98	N/A
468	L/K/D	3.3	100	Met
469	L/K/D	3.1	100	Met
470	Bedroom	2.2	99	Met
471	Bedroom	2.1	99	Met
472	Bedroom	3	99	Met
473	Bedroom	2.3	98	N/A
474	L/K/D	4.9	100	Met
475	Bedroom	3.6	100	Met
476	Bedroom	5	100	N/A
477	L/K/D	2.2	100	N/A
478	L/K/D	1.4	91	Met
479	Bedroom	3.9	100	N/A
480	Bedroom	3.4	99	N/A
481	L/K/D	2.3	99	N/A
482	L/K/D	1.8	98	Not Met
483	L/K/D	2.8	98	N/A
484	Bedroom	2.4	96	Met
485	Bedroom	3	96	Met

Table 23: Assessment Data

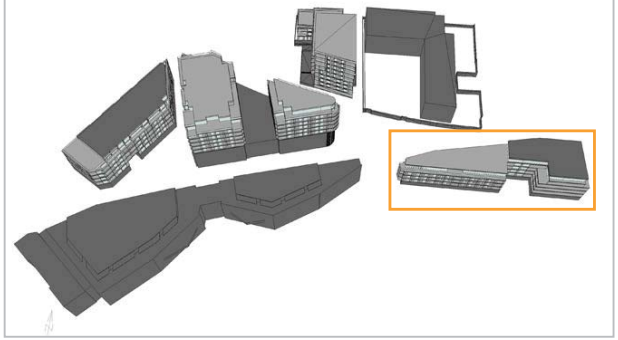


Figure 24: Plan View

Room No.		Daylight Quantum ADF%	Distribution of Daylight NSL%	RDC
Block D - Level 04				
486	L/K/D	13.6	100	N/A
487	Bedroom	9.1	100	Met
488	Bedroom	2.3	100	N/A
489	L/K/D	3.1	100	Met
490	Bedroom	3.3	99	N/A
491	L/K/D	4.4	100	Met
492	L/K/D	3.9	100	Met
493	Bedroom	2.2	100	Met
494	Bedroom	2.2	99	Met
495	Bedroom	3.5	99	Met
496	L/K/D	4.3	100	N/A
497	L/K/D	5.3	100	N/A
498	Bedroom	4.5	100	Met
499	Bedroom	4.7	100	Met
500	L/K/D	5.2	88	N/A
501	Bedroom	5.7	100	Met
502	Bedroom	6.1	100	Met

Table 24: Assessment Data

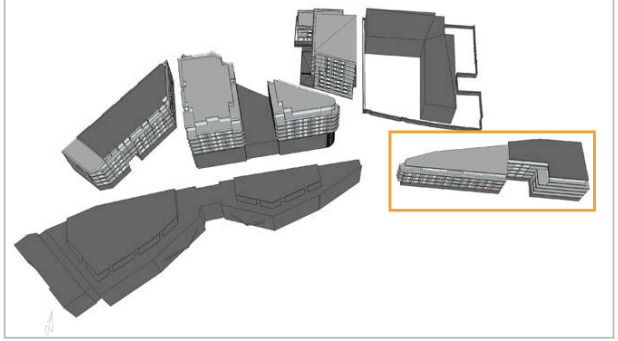


Figure 25: Plan View

Room No.		Daylight Quantum ADF%	Distribution of Daylight NSL%	RDC
Block D - Level 05				
503	L/K/D	13.9	100	N/A
504	Bedroom	9	100	Met
505	Bedroom	9	100	Met
506	Bedroom	9.2	100	Met
507	Bedroom	12.8	100	Met
508	L/K/D	11.6	100	N/A
509	L/K/D	7.8	100	N/A
510	Bedroom	3.1	100	Met
511	Bedroom	13	100	Met

Table 25: Assessment Data

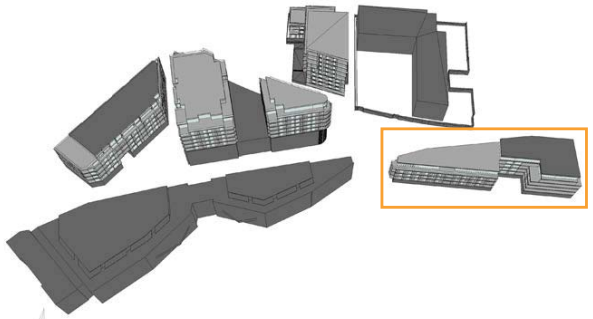


Figure 26: Plan View

Internal Sunlight Assessments

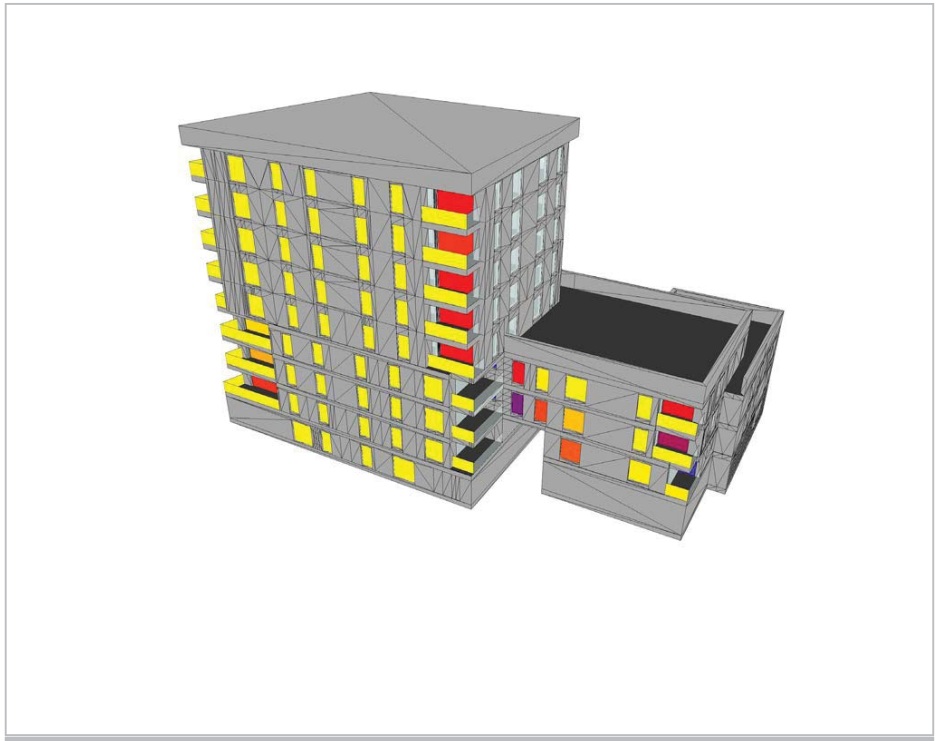


Figure 27: Plan View

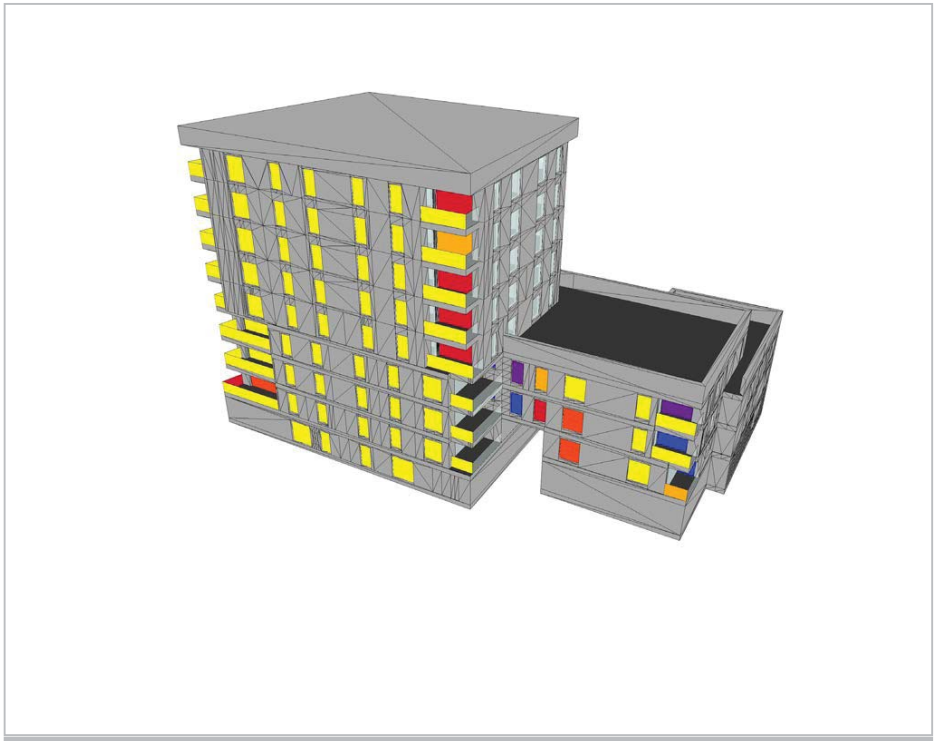
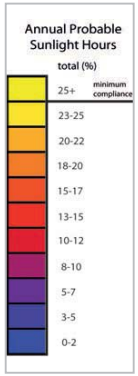
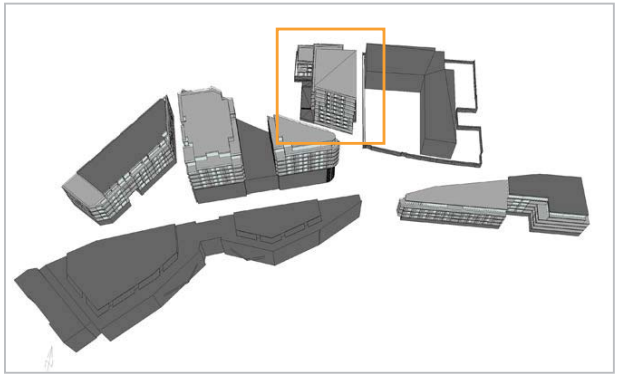
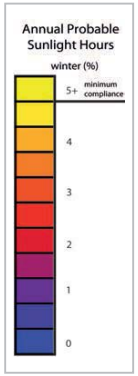


Figure 28: Plan View







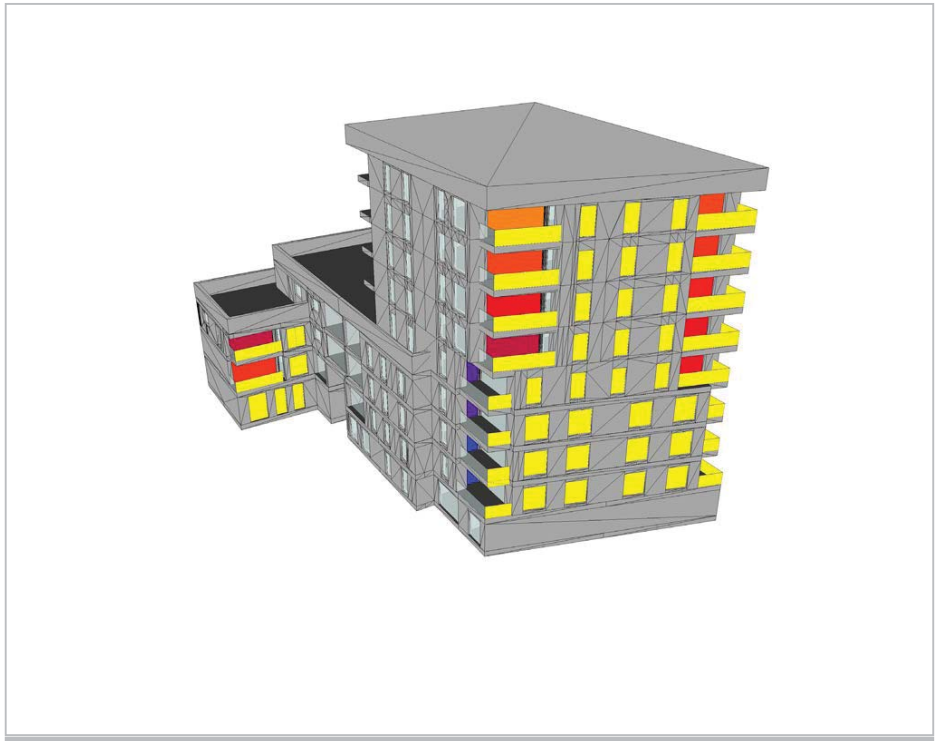


Figure 29: Plan View

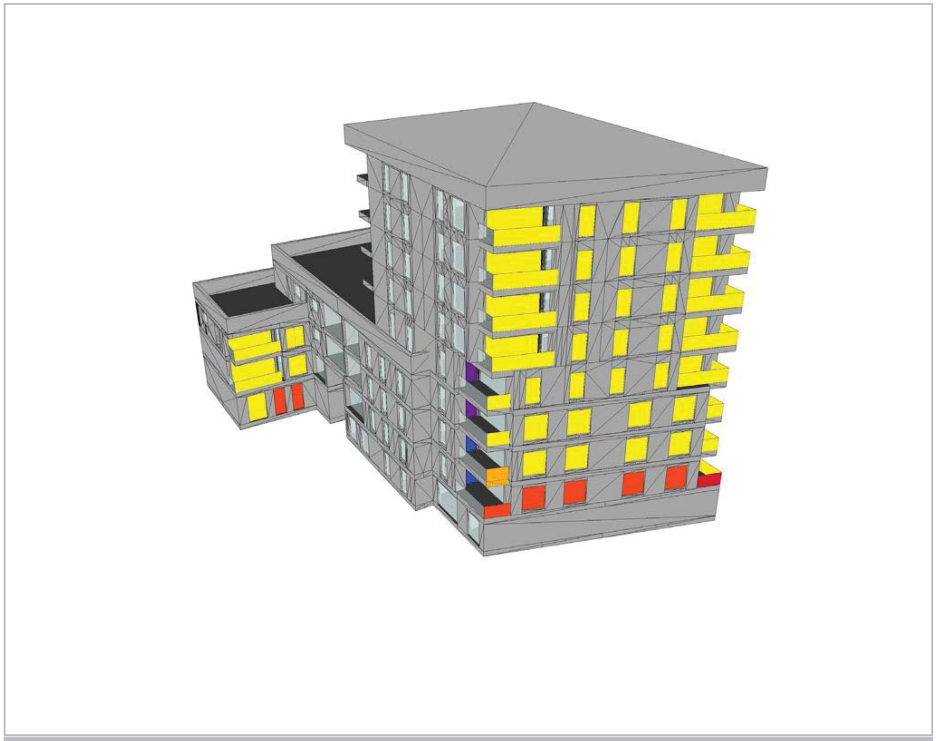
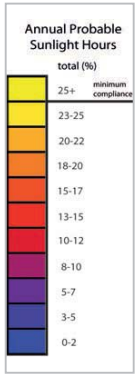
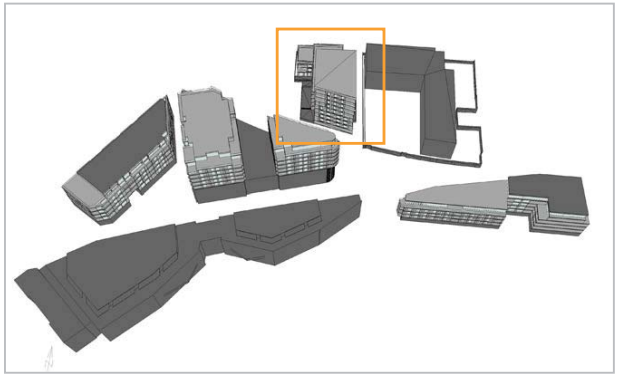
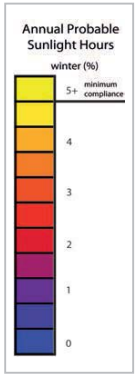


Figure 30: Plan View







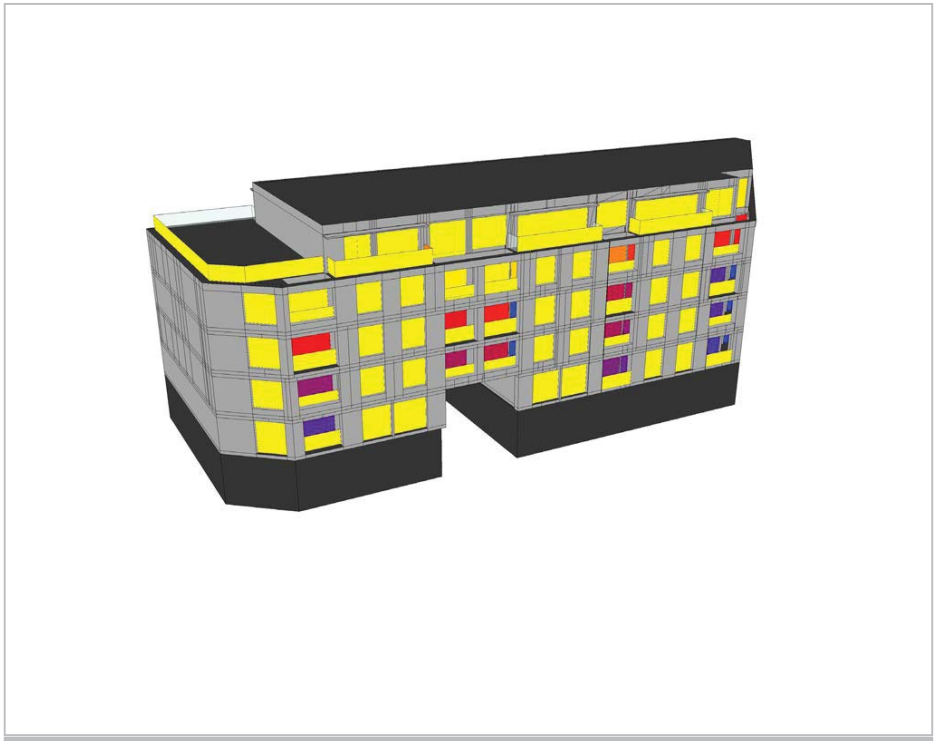


Figure 31: Plan View

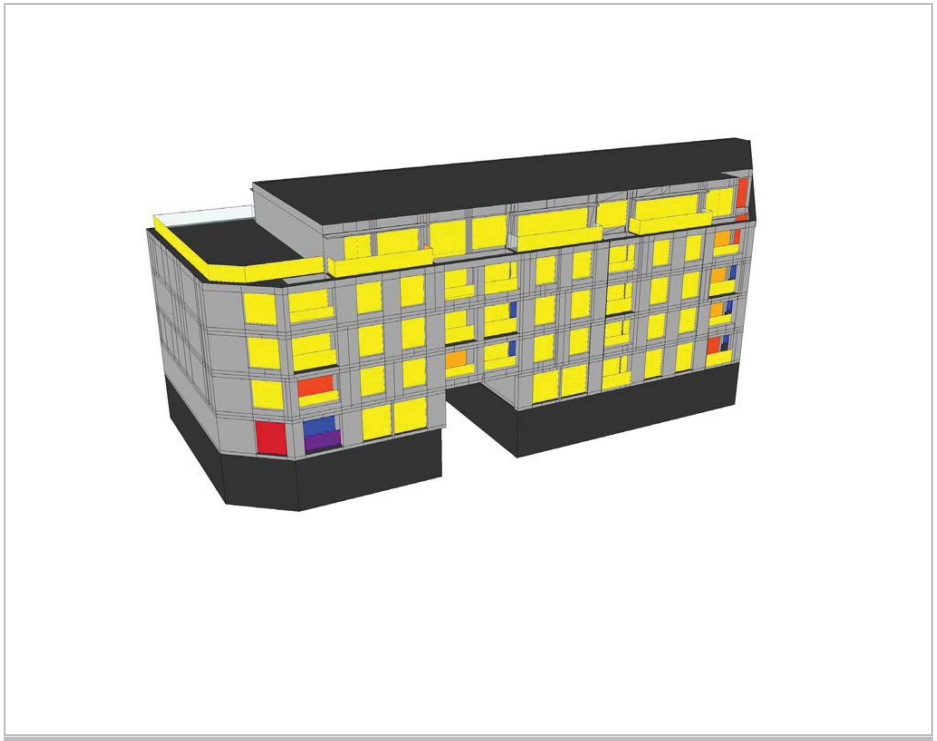
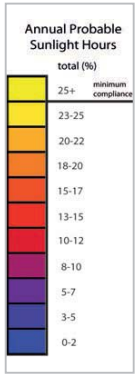
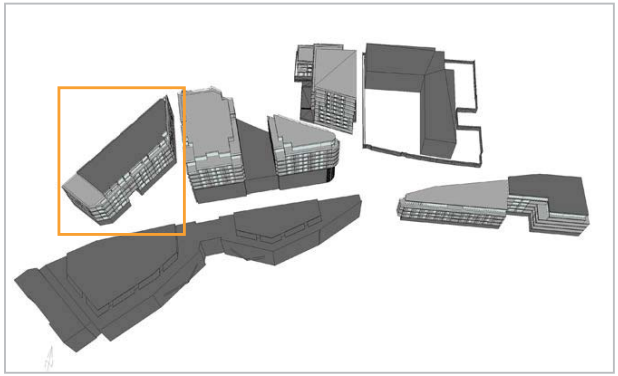


Figure 32: Plan View





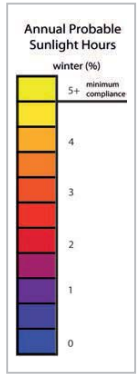
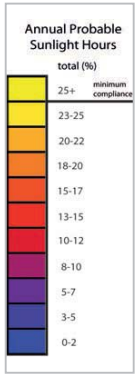
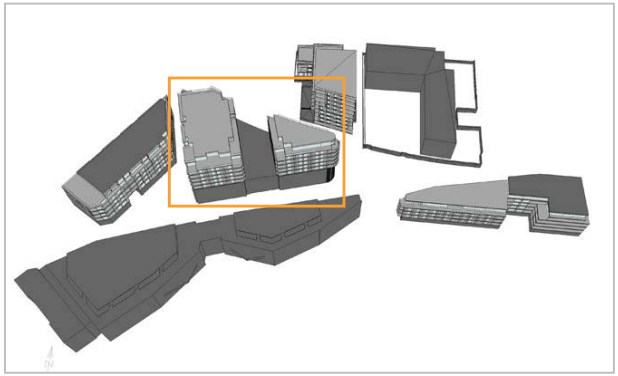
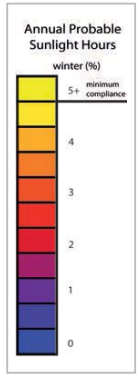


Figure 33: Plan View

Figure 34: Plan View







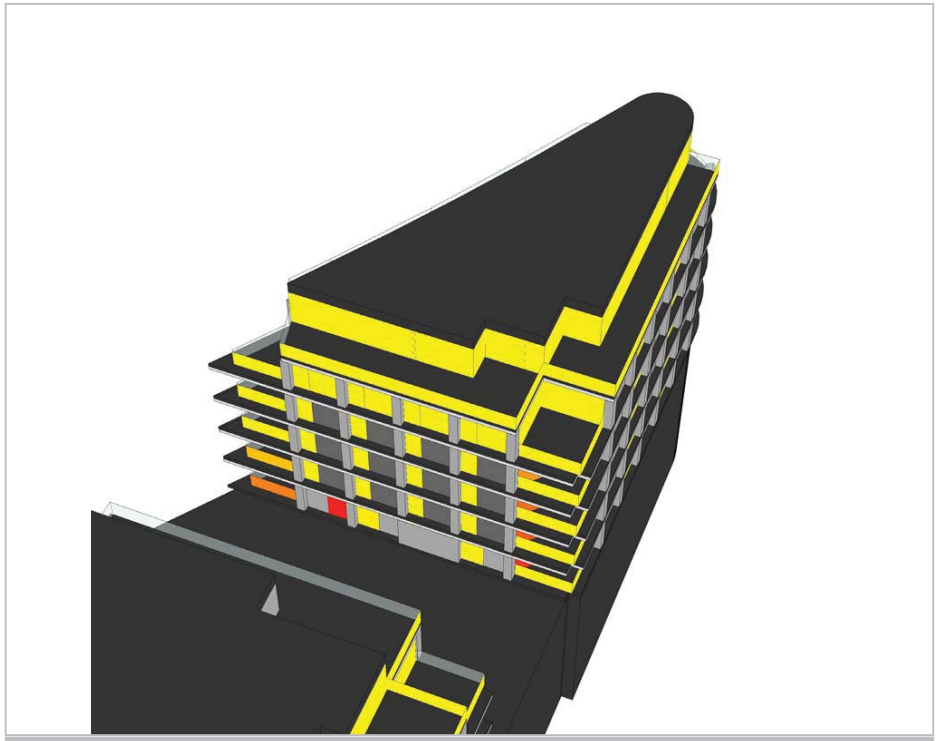


Figure 35: Plan View

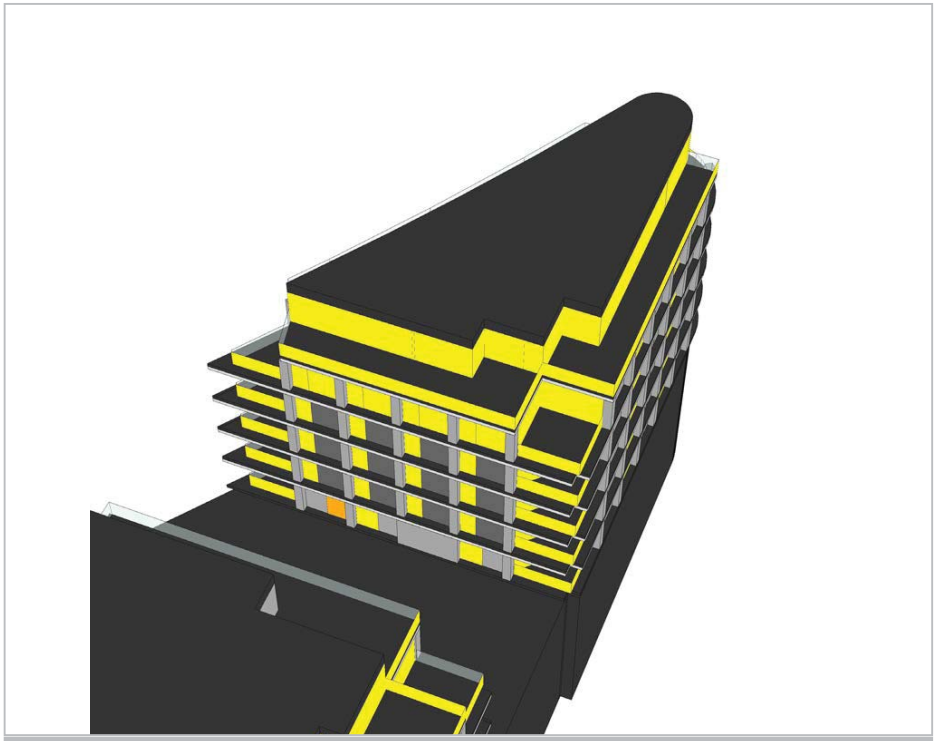
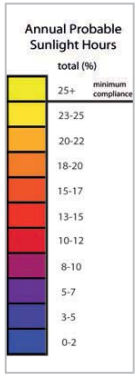
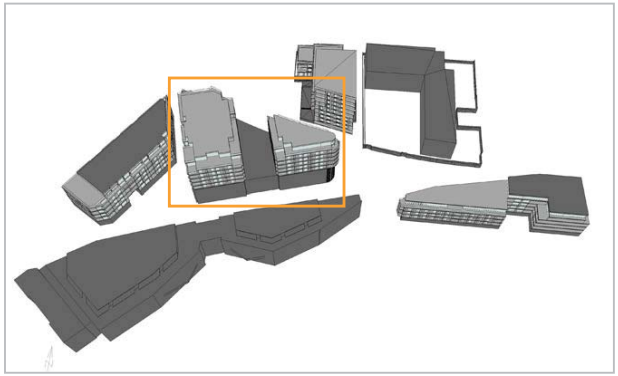
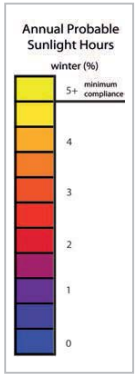


Figure 36: Plan View







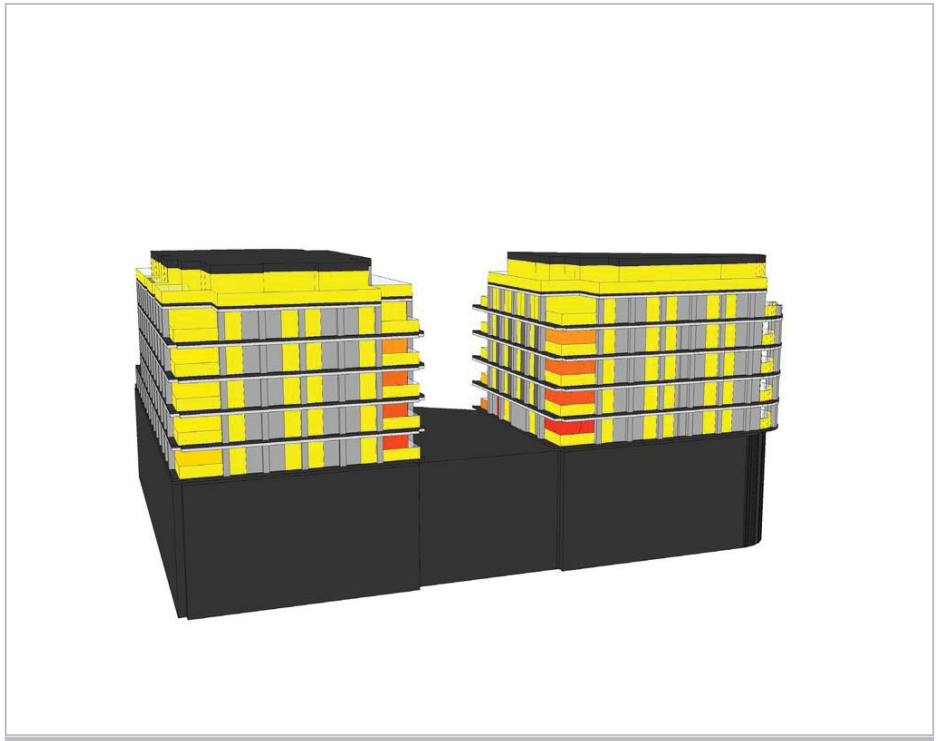


Figure 37: Plan View

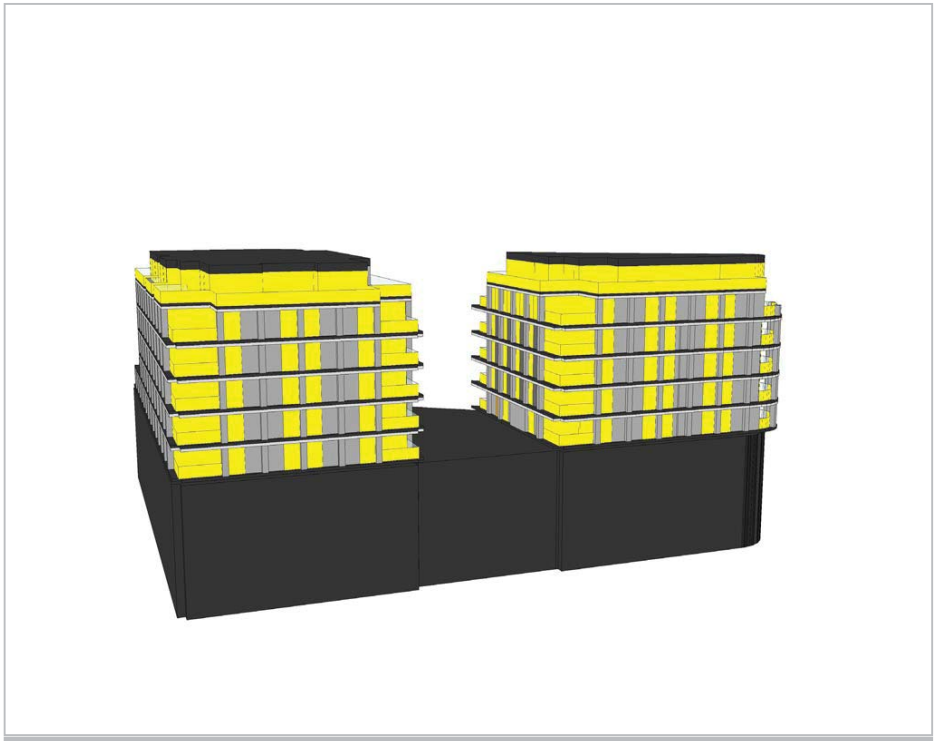
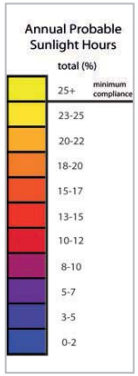
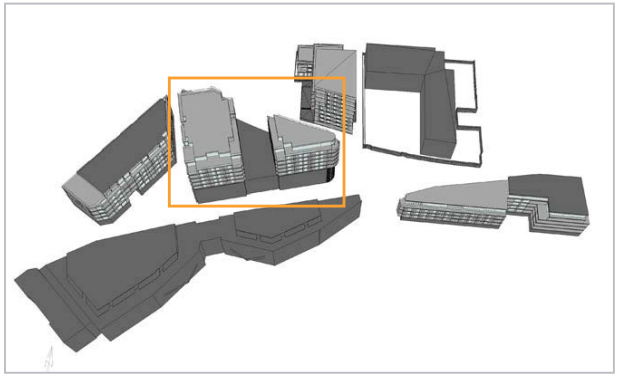
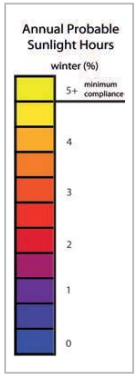


Figure 38: Plan View







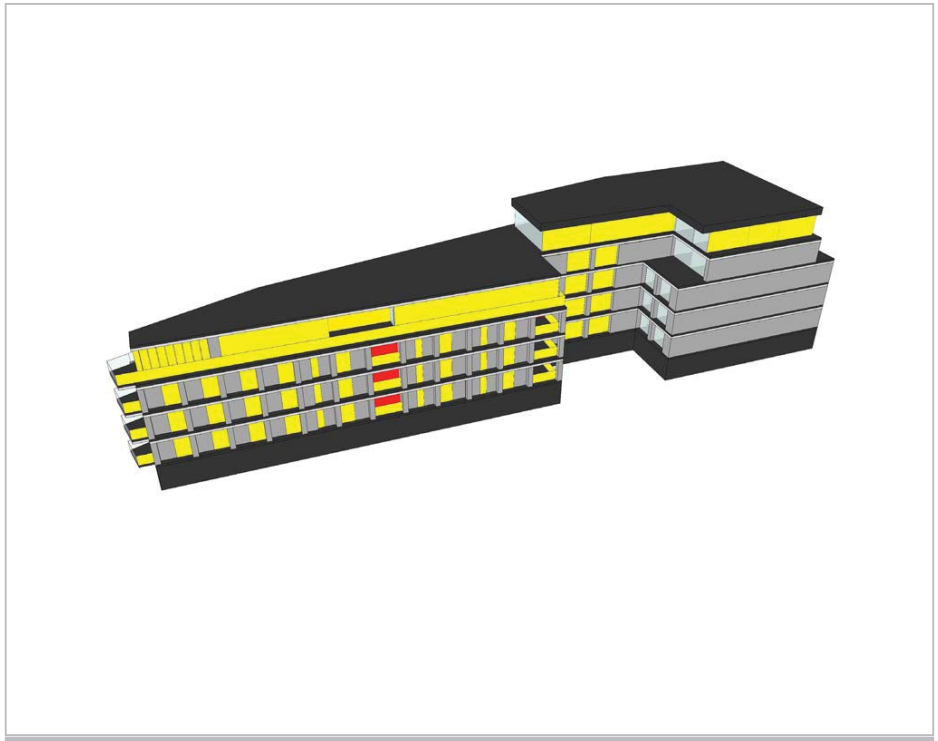


Figure 39: Plan View

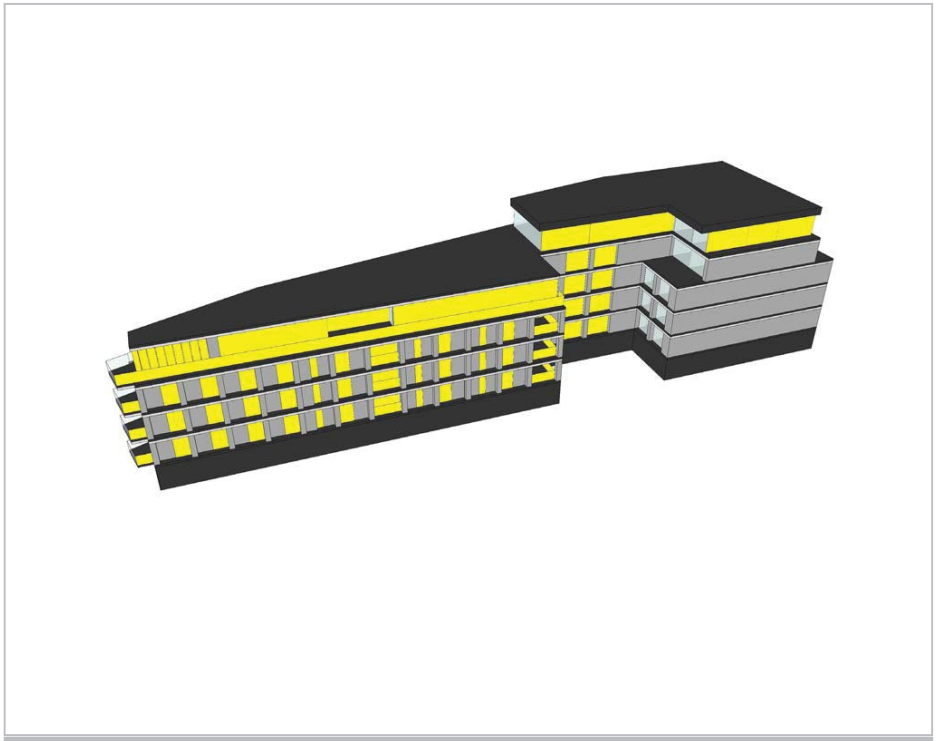
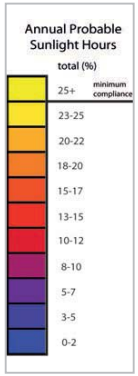
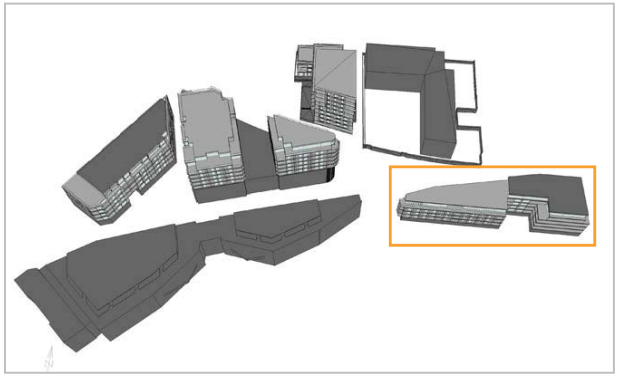
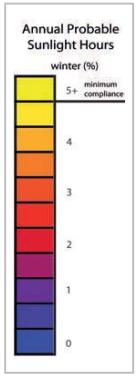


Figure 40: Plan View







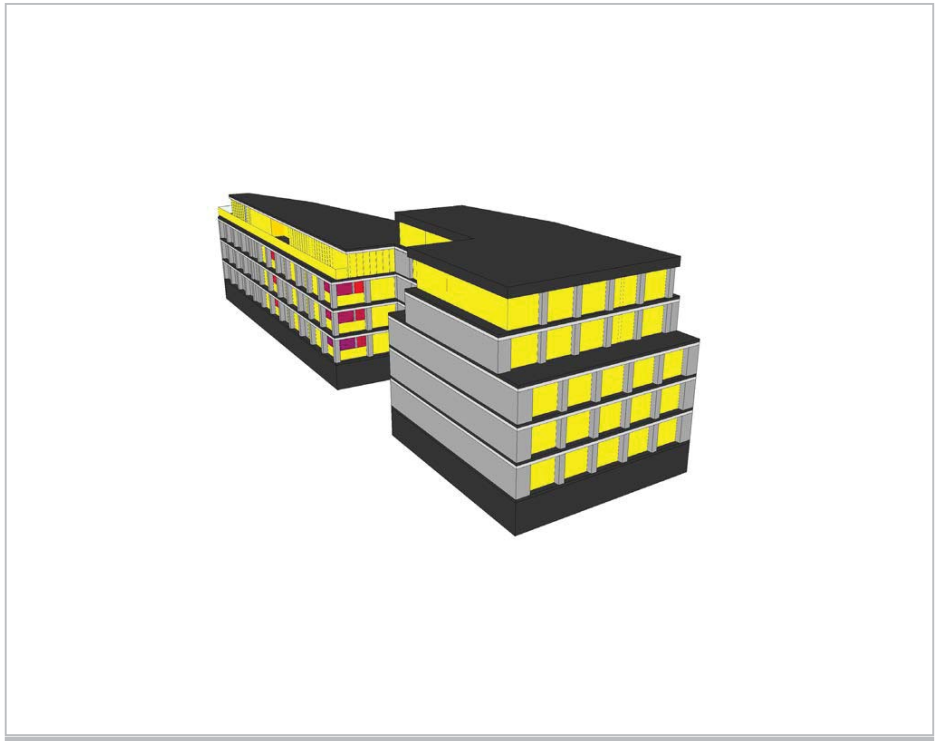


Figure 41: Plan View

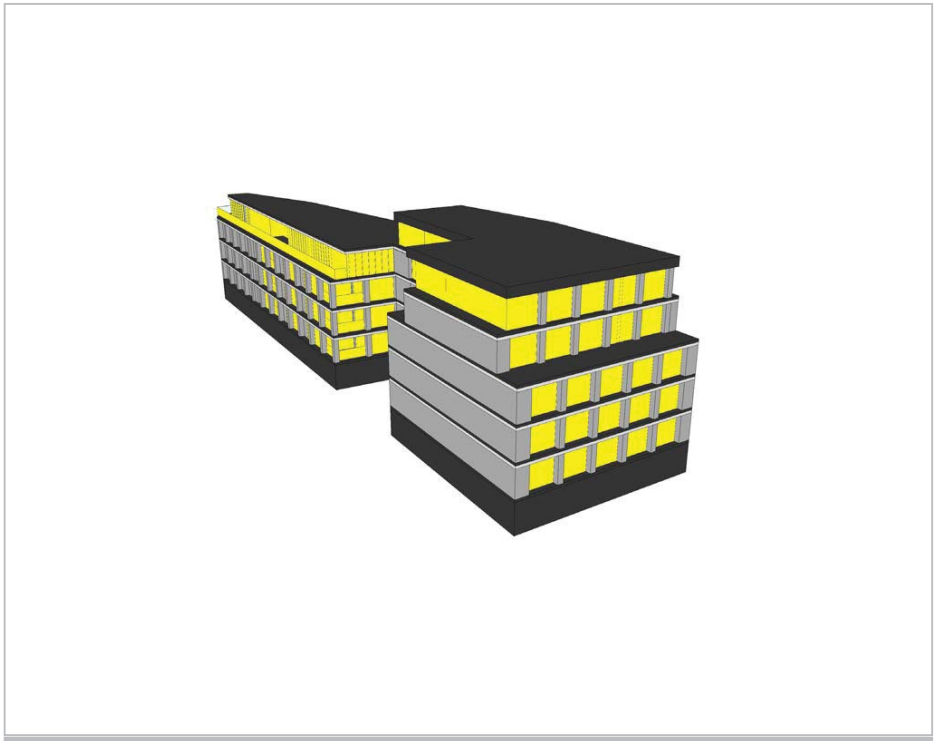
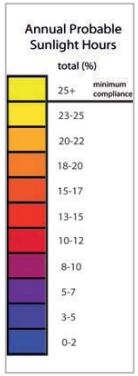
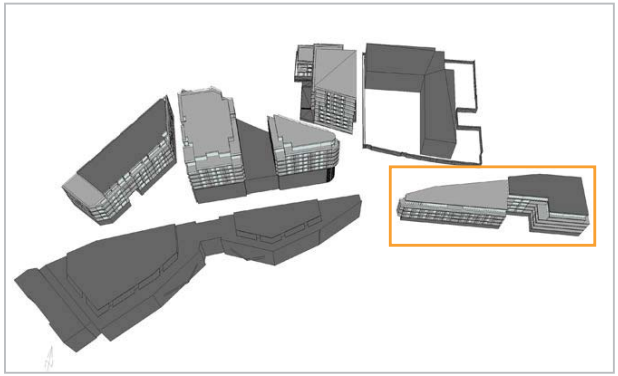
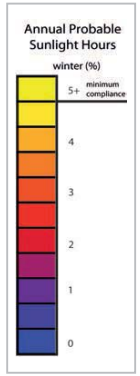


Figure 42: Plan View

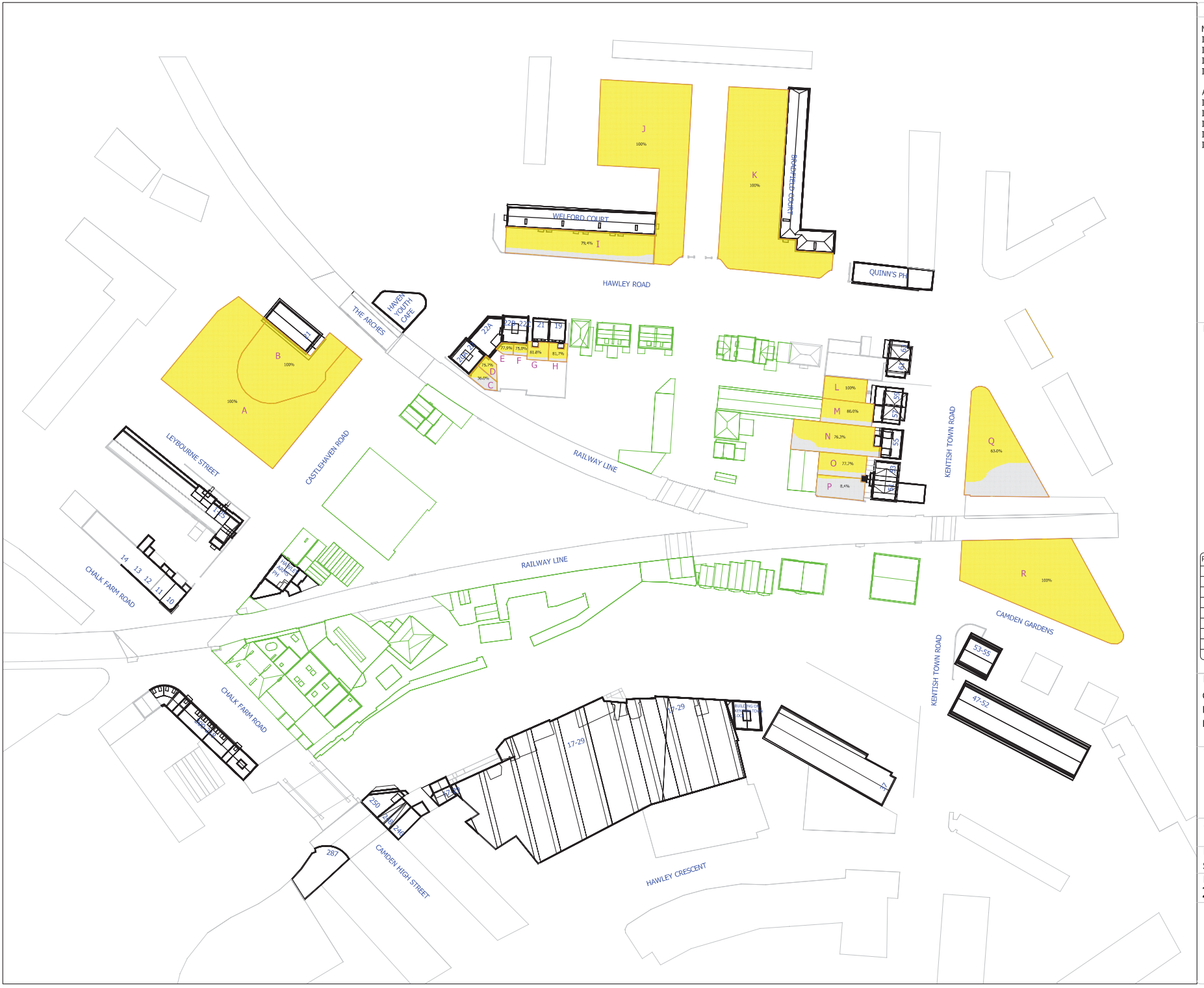






Appendix 17.5

Permanent Overshadowing Results
(Sun Hours on Ground)



Sources of Information

MAKE
IR50-2801
IR75- MAKE 24 Nov 2011
IR77-MAKE 08-12-11
IR 78-Make revised models 8 Dec

AHMM
IR59-2801
IR61-2801
IR64-2801
IR65-2801
IR76- AHMM 29 Nov 2011

Notes

N.B. DO NOT SCALE OFF THIS DRAWING

EXISTING BUILDINGS
AHMM SCHEME
MAKE SCHEME

REGION WITH MORE THAN 2 HOURS OF DIRECT SUNLIGHT
REGION WITH LESS THAN 2 HOURS OF DIRECT SUNLIGHT

% OF REGION IN MORE THAN 2 HOURS DIRECT SUNLIGHT

Rev	Date	Description	Initials
A		Initial Issue	

Project
CAMDEN LOCK VILLAGE
LONDON
NW1

Title
BRE 2 HOURS OVERSHADOWING TEST
EXISTING BUILDINGS

Scale 1:1200@A3
Date DEC'11
Drawn SDJ
Checked
Drawing No. 2801-116
Rel No, 22
Revision A

gia
The Whitehouse
Belvedere Road
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f 020 7202 1401
mail@gla.uk.com
www.gla.uk.com