CHARTERED SURVEYORS

DAYLIGHT & SUNLIGHT

INTERNAL DAYLIGHT, SUNLIGHT AND OVERSHADOWING REPORT

Branch Hill House

18 December 2019

GIA No: **13769**

RICS

PROJECT DATA:

Client	**Almax Group**
Architect	**Stanhope Gate Architecture**
Project Title	**Branch Hill House**
Project Number	**13769**

REPORT DATA:

Report Title	**Internal Daylight, Sunlight and Overshadowing Report**
GIA Department	**Daylight & Sunlight**
Dated	**18 December 2019**
Prepared by	**PCA**
Checked by	**SPA**
Type	**Planning**

Revisions	No:	Date:	Notes:	Signed:

SOURCES OF INFORMATION:

Information Received	**IR-18-13769**
Release Number	**Rel_07_13769_DSD**
Issue Number	**06**
Site Photos	**GIA**
3D models	**VERTEX**
OS Data	**FIND Maps**

Map data

CONTENTS

1 EXECUTIVE SUMMARY 2
2 INTRODUCTION 3
3 BRE GUIDELINES 4
4 METHODOLOGY 8
5 CONCLUSIONS 10
6 INTERNAL DAYLIGHT & SUNLIGHT ASSESSMENTS 12
7 OVERSHADOWING ASSESSMENTS 24

1 EXECUTIVE SUMMARY

1.1 EXECUTIVE SUMMARY

The purpose of this report is to ascertain whether the proposed scheme at Branch Hill House, NW3 7LS, will provide residential accommodation considered acceptable in terms of daylight, sunlight and overshadowing.

GIA have worked alongside the design team to maximise daylight and sunlight within the proposed scheme. To this end, a number of design strategies have been incorporated to enhance the quality of light within the proposed accommodation. Further details can be found in paragraph 5.1.

This report contains the final results of the assessments undertaken for all the proposed habitable rooms and the communal open space.

Overall, the results of the daylight analysis show that the proposed development will provide future occupants with excellent levels of daylight, with 87% of all the habitable rooms meeting or exceeding the levels of Average Daylight Factor (ADF) recommended by BRE. In addition, 98% of all rooms will also see good levels of No-Sky Line (NSL) and all of them have been designed in accordance with the Room Depth Criterion (RDC) where applicable. Further detail can be found in section 5.2.

In terms of sunlight, 27 (96%) out of all 28 living areas suitable for testing meet or exceed the recommendations by BRE and receive excellent levels of sunlight. Further detail can be found in section 5.3.

The overshadowing assessments of the communal open spaces show that, whilst not technically meeting the BRE recommendation, the proposed areas will be excellently sunlit throughout the summer. Further detail can be found in section 5.4.

GIA therefore conclude that the proposed scheme makes the most of the available daylight and sunlight and will offer overall excellent levels of daylight and sunlight amenity to future occupants.

2 INTRODUCTION

2.1 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 scheme prepared by Stanhope Gate Architecture. GIA was specifically instructed to carry out the following:

- To create a 3D computer model of the proposal based upon drawings prepared by Stanhope Gate Architecture.
- Carry out a daylight assessment using the methodologies set out in the BRE guidance for Average Daylight Factor, No-Sky Line and Room Depth Criterion.
- Carry out a sunlight assessment using the methodologies set out in the BRE guidance for Annual Probable Sunlight Hours (APSH) to the fenestration facing within 90° of due south.
- Carry out an overshadowing assessment using the methodology set out in the BRE guidance for Sun Hours On Ground (SHOG) for all relevant amenity areas.
- Prepare 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.

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 and states that its 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 also acknowledges 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. These are summarised below.

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 Code of practice for daylighting (BS 8206-2) and the CIBSE Lighting Guide LG 10 Daylighting and window design contain advice and guidance on interior daylighting. The guidance contained in this publication (BR 209) is intended to be used with BS 8206-2 and LG 10. Both these publications refer to BR 209.

For skylight BS 8206-2 and LG 10 put forward three main criteria, based on average daylight factor (ADF); room depth; and the position of the no sky line."

These assessments are set out below.

Average Daylight Factor (ADF)

"If a predominantly daylit appearance is required, then the ADF 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 additional recommendations are minimum values of ADF which should be attained even if a predominantly daylit appearance is not achievable."

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.

Room Depth Criterion (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.

No Sky Line (NSL)

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 (normally more than 20%) lies beyond the no sky line (ie 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, the area which does not receive direct skylight should not exceed 20% of the floor area, as quantified in the BS 8206 Part2 2008.

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 properties, 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."*

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

The guide proposes minimizing the number of dwellings whose living room face solely north unless there is some compensating factor such as an appealing view to the north, and it suggests a number of techniques to do so. Further more, it discusses massing solutions with a sensitive approach to overshadowing, so as to maximize access to sunlight.

At the same time it acknowledges that the site's existing urban environment may impose orientation or overshadowing constraints which may not be possible to overcome.

To quantify sunlight access for interiors where sunlight is expected, it refers to the BS 82606-2 criterion of Annual Probable Sunlight Hours. APSH is defined as *"the total number of hours in the year that the sun is expected to shine on unobstructed ground, allowing for average levels of cloudiness at the location in question."* In line with the recommendation, APSH is measured from a point on the inside face of the window, should the locations have been decided. If these are unknown, sunlight availability is checked at points 1.6m above the ground or the lowest storey level on each main window wall, and no more than 5m apart. If a room has multiple windows on the same wall or on adjacent walls, the highest value of APSH should be taken into account. If a room has two windows on opposite walls, the APSH for each can be added together.

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 of due south, and*
- *The centre of at least one window to a main living room can receive 25% of annual probable sunlight hours, including at least 5% of annual probable sunlight hours in the winter months between 21 September and 21 March. "*

In paragraph 3.1.11 the BRE guidance suggests that if a room faces significantly North of due East or West it is unlikely to meet the recommended levels proposed by the BS 8206-2. As such, it is clear that only windows facing within 90 degrees of due South can be assessed using this methodology.

It is also worth noting how paragraph 5.3 of the BS 8206-2 suggests that with regards to sunlight duration *"the degree of satisfaction is related to the expectation of sunlight. If a room is necessarily north facing or if the building is in a densely-built urban area, the absence of sunlight is more acceptable than when its exclusion seems arbitrary"*.

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)*
- *make outdoor activities, like sitting out and children's play more pleasant (mainly warmer months)*
- *encourage plant growth (mainly spring and summer)*
- *dry out the ground, reducing moss and slime (mainly in colder months)*
- *melt frost, ice and snow (in winter)*
- *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 sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March. If as a result of new development an existing garden 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 be carried out, it is recommended that the centre of the area should receive at least 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 65° (obstruction angle less than 25° or VSC at least 27 percent) conventional window design will usually give reasonable results.

If 'theta' is between 45° and 65° (obstruction angle between 25° and 45°, 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 25° and 45° (obstruction angle between 45° and 65°, VSC from 5 to 15 percent), it is very difficult to provide adequate daylight unless very large windows are used.

If 'theta' is less than 25° (obstruction angle more than 65°, 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 in the previous pages, 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 Stanhope Gate Architecture. 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 of Average Daylight Factor values. These values are shown in Table 1.

Table 01: Typical reflectance, transmittance and maintenance factors

REFLECTANCE VALUES:	
Surrounding	0.2
Pavement	0.2
Grass	0.1
Water	0.1
Yellow brick	0.3
Red brick	0.2
Portland Stone	0.6
Concrete	0.4
Internal walls (light grey)	0.68
Internal ceiling (white paint)	0.85
Internal floor (medium veneer)	0.3
Internal floor (light veneer)	0.4

TRANSMITTANCE VALUES	TV
Triple glazing (Low-E): Pilkington K Glass 4/12/4/12/4 Argon filled 90%	0.63
Double glazing (Low-E): Pilkington K Glass 4/16/4 Argon filled 90%	0.75
Single glazing: Pilkington Optifloat Clear 4mm Annealed	0.90
Translucent glazing (Low-E): Pilkington Optifloat Opal - 4mm K /16/4mm Opal	0.74

MAINTENANCE FACTORS: GLAZING TYPE	TV (Normal)	A.3	A.4	A.5	A.6	TV (Total)
Triple Low-E (frames modelled)	0.63	8	1	1	1	0.58
Triple Low-E (frames not modelled)	0.63	8	1	1	0.8	0.46
Triple Low-E (inclined, frames modelled)	0.63	8	2	1	1	0.53
Triple Low-E (inclined, frames not modelled)	0.63	8	2	1	0.8	0.42
Triple Low-E (horizontal, frames modelled)	0.63	8	3	1	1	0.48
Triple Low-E (horizontal, frames not modelled)	0.63	8	3	1	0.8	0.38
Double Low-E (frames modelled)	0.75	8	1	1	1	0.69
Double Low-E (frames not modelled)	0.75	8	1	1	0.8	0.55
Double Low-E (inclined, frames modelled)	0.75	8	2	1	1	0.63
Double Low-E (inclined, frames not modelled)	0.75	8	2	1	0.8	0.50
Double Low-E (horizontal, frames modelled)	0.75	8	3	1	1	0.57
Double Low-E (horizontal, frames not modelled)	0.75	8	3	1	0.8	0.46
Single (frames modelled)	0.9	8	1	1	1	0.83
Single (frames not modelled)	0.9	8	1	1	0.8	0.66
Single (inclined, frames modelled)	0.9	8	2	1	1	0.76
Single (inclined, frames not modelled)	0.9	8	2	1	0.8	0.60
Single (horizontal, frames modelled)	0.9	8	3	1	1	0.68
Single (horizontal, frames not modelled)	0.9	8	3	1	0.8	0.55
Double Translucent Low-E (frames modelled)	0.74	8	1	1	1	0.68
Double Translucent Low-E (frames not modelled)	0.74	8	1	1	0.8	0.54
Double Translucent Low-E (inclined, frames modelled)	0.74	8	2	1	1	0.62
Double Translucent Low-E (inclined, frames not modelled)	0.74	8	2	1	0.8	0.50
Double Translucent Low-E (horizontal, frames modelled)	0.74	8	3	1	1	0.56
Double Translucent Low-E (horizontal, frames not modelled)	0.74	8	3	1	0.8	0.45

5 CONCLUSIONS

5.1 DESIGN EVOLUTION

In order to ascertain the levels of daylight and sunlight within the proposed scheme at Branch Hill House, NW3 7LS, technical assessments have been undertaken within all proposed habitable rooms (i.e. Living rooms, Living/Kitchen/Dining rooms, Kitchens and Bedrooms) and the proposed communal open space. The results of the internal daylight and sunlight assessments can be found on pages 12 to 23 of this report, whilst those for the overshadowing of the communal open space can be found on pages 24 and 25.

GIA have worked alongside Stanhope Gate Architects to deliver a scheme that makes the most of the available daylight and sunlight to provide good quality residential accommodation. To this end, preliminary assessments on the massing have been undertaken from inception, and an iterative review of the internal layouts and façade details has been provided throughout the design process. Once the interim internal arrangements were set out, interim assessments have been carried out and advice on a room-by-room basis and on the communal open space has been provided to optimise daylight and sunlight amenity.

Strategies that have been implemented include:

- Prioritising daylight in living areas where it is typically most valued by occupants;
- Reconfiguring some of the internal layouts to optimise internal daylight;
- Reviewing the fenestration in a number of proposed rooms in response to the interim tests;
- Balancing the provision of private amenity in the form of balconies with the internal daylight and sunlight levels. Whilst providing a valuable form of amenity, these also introduce additional obstructions for the windows directly below, therefore reducing the light ingress within the rooms further;
- Reconfiguring the communal open space layout to provide good sunlight amenity.

The scheme makes excellent use of the daylight and sunlight available overall and will provide all future residents with very good daylight and sunlight amenity.

5.2 CONCLUSIONS ON DAYLIGHT

All proposed habitable rooms have been assessed for Average Daylight Factor (ADF), No-Sky Line (NSL) and Room Depth Criterion (RDC).

Overall, 125 (87%) out of all 143 proposed habitable rooms meet or exceed the BRE recommendation for daylight quantum (ADF) and 140 (98%) achieve the recommended level for sky visibility (NSL). All rooms have been designed in accordance with BRE's RDC, where applicable. It is worth noting that many rooms far exceed BRE's minimum recommendations, providing excellent daylit spaces.

Only two combined Living/Kitchen/Dining (L/K/D) spaces fall short of recommendation. One of these achieves the recommended 1.5% ADF for living rooms, whilst the other is very generously sized. In both cases, future occupants will be able to enjoy good daylight amenity in the front portions of these rooms.

Owing to the design objective of prioritising daylight in living areas, a number of secondary rooms see daylight levels below recommendation. These are two TV rooms, four bedrooms, and ten kitchens.

GIA conclude that the proposed development will offer its occupants very good levels of daylight overall.

5.3 CONCLUSIONS ON SUNLIGHT

In order to ascertain the levels of sunlight within the proposed residential accommodation, all the living spaces with a main window facing within 90 degrees of due south have been assessed for Annual Probable Sunlight Hours (APSH).

The results show that 27 (96%) out of all 28 rooms suitable for testing see excellent levels of sunlight throughout the year as well as during the winter months.

The only room seeing lower sunlight levels is located behind a large balcony. Whilst providing a valuable form of amenity, the balcony also intercepts sun rays, acting as shading device, therefore reducing sunlight ingress. Future occupants, however, will be able to enjoy sunlight amenity whilst using the balcony.

The scheme will therefore provide future occupants with excellent levels of sunlight amenity.

5.4 CONCLUSIONS ON OVERSHADOWING

As suggested by BRE, the proposed communal open space has been assessed for Sun Hours on Ground (SHOG).

The results presented on page 24 show that 37.2% and 27.8% of the two proposed communal areas will see more than two hours of direct sunlight on 21st March. Whilst not technically meeting the 50% recommendation by BRE, this is achieved only a few days later on 25th March and 30th March respectively.

In addition to the BRE test, sun exposure diagrams presented on page 25, illustrating the number of sunlight hours available in these areas throughout the summer months, from March to September. These diagrams demonstrate that most of the communal spaces will receive excellent sunlight exposure from April to August, when they are most likely to be in use.

As such, despite the areas not technically meeting the recommendation for sunlight by BRE, future occupants will be able to enjoy good sunlight amenity in the proposed communal open spaces.

6 INTERNAL DAYLIGHT & SUNLIGHT ASSESSMENTS

Basement

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION			SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC		ANNUAL	WINTER
BASEMENT							
1	TV room	0.5	23	MET			

Table 02: Assessment Data

Fig. 01: Floor Plan

Ground Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION			SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC		ANNUAL	WINTER
GROUND FLOOR							
2	Bedroom	3.5	100	N/A			
3	Bedroom	3.2	99	MET			
4	L/K/D	4.3	100	N/A		99	30
5	Bedroom	1.9	97	MET			
6	Bedroom	1.2	96	MET			
7	Bedroom	2.8	100	N/A			
8	Living Room	2.4	96	N/A		74	28
9	Study	2.1	100	MET			
10	Bedroom	1.7	96	MET			
11	Kitchen	0.7	100	MET			
12	Bedroom	1.4	97	MET			
13	Kitchen	2	99	MET			
14	Bedroom	2.4	98	MET			
15	Living Room	1.8	100	MET		74	26
16	TV room	0.9	74	MET			
17	Kitchen	2.5	100	MET			
18	Bedroom	3.3	99	N/A			
19	Living Room	2.3	100	MET			
20	Bedroom	4	100	N/A			
21	Living Room	1.5	98	MET			
22	Bedroom	2.3	98	MET			
23	Bedroom	2.2	99	MET			
24	Bedroom	1.1	87	MET			
25	Bedroom	2.3	97	MET			
26	Bedroom	0.6	96	MET			
27	Bedroom	0.7	82	MET			
28	Bedroom	2.4	96	MET			
29	Living Room	2.5	99	MET		59	20
30	Kitchen	2.3	99	MET			
31	Living Room	2.4	100	N/A		61	19
32	Kitchen	1.6	98	MET			
33	Bedroom	2.9	99	MET			
34	Bedroom	1	90	MET			

Table 03: Assessment Data

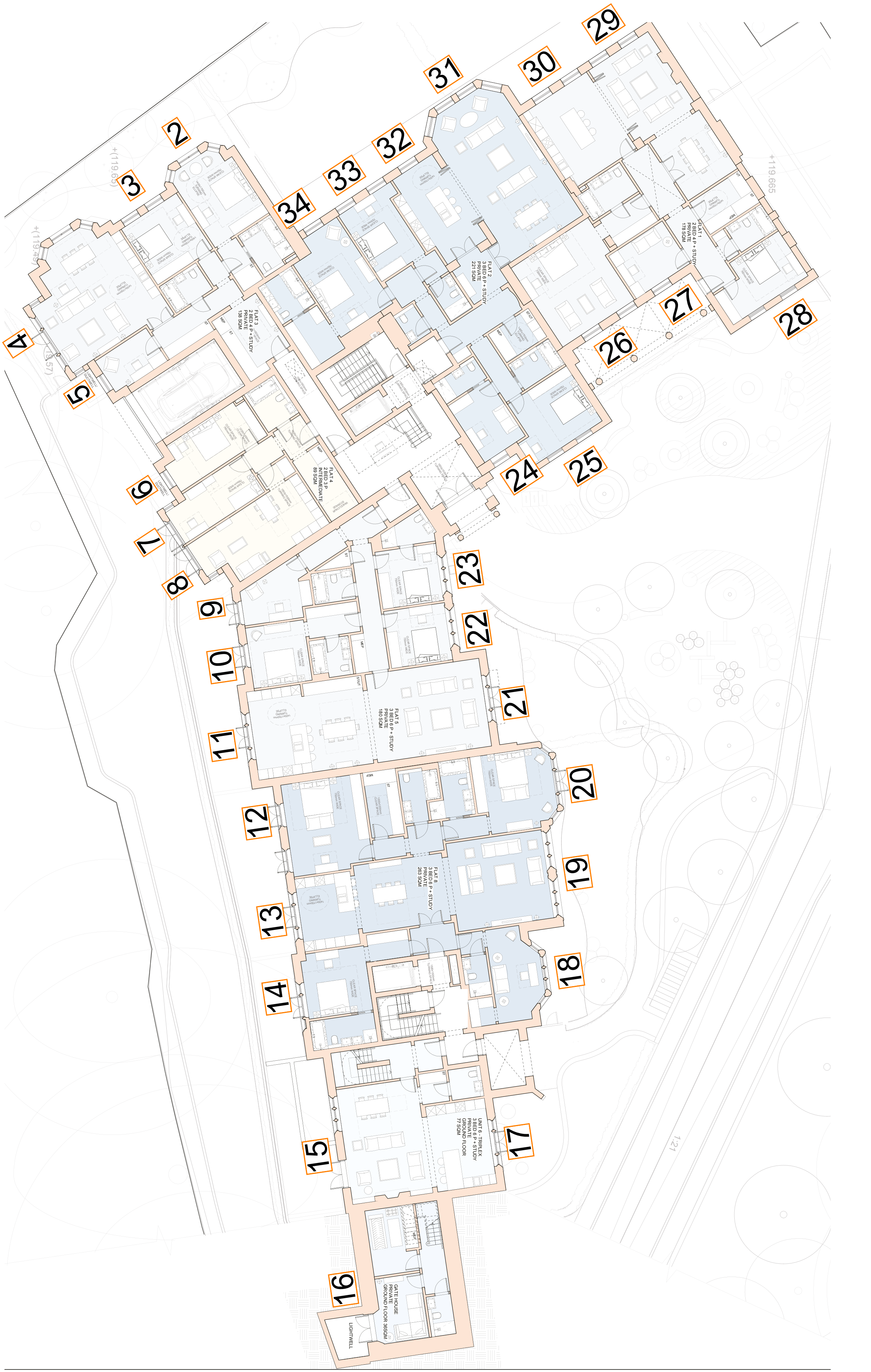


Fig. 02: Floor Plan

First Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION			SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC		ANNUAL	WINTER
FIRST FLOOR							
35	Study	2.2	92	MET			
36	Living Room	4.2	100	N/A		64	22
37	Bedroom	1.3	94	MET			
38	L/K/D	4	99	N/A		83	30
39	Bedroom	1.4	97	MET			
40	Bedroom	1.9	97	MET			
41	L/K/D	2.1	99	MET		57	22
42	Bedroom	2.2	100	MET			
43	L/K/D	0.7	98	MET		25	15
44	Bedroom	1.9	99	MET			
45	Bedroom	2	98	MET			
46	Kitchen	1.3	100	MET			
47	Bedroom	1.9	98	MET			
48	Bedroom	2.9	98	MET			
49	Kitchen	1.5	100	N/A			
50	Bedroom	3.3	99	MET			
51	Bedroom	2.8	99	MET			
52	Kitchen	2.8	93	MET			
53	L/K/D	2.8	100	N/A		77	27
54	Bedroom	2.4	96	N/A			
55	Study	3.3	97	MET			
56	Bedroom	3.9	99	N/A			
57	Living Room	2.4	100	N/A			
58	Bedroom	2.4	92	MET			
59	Living Room	1.5	100	MET			
60	Bedroom	2.3	96	MET			
61	Bedroom	2.2	95	MET			
62	Study	3	92	MET			
63	Bedroom	5.1	99	MET			
64	Bedroom	3.5	93	MET			
65	Bedroom	3.3	100	N/A			
66	Kitchen	3.4	99	MET			
67	Living Room	1.9	98	MET		33	9

Table 04: Assessment Data

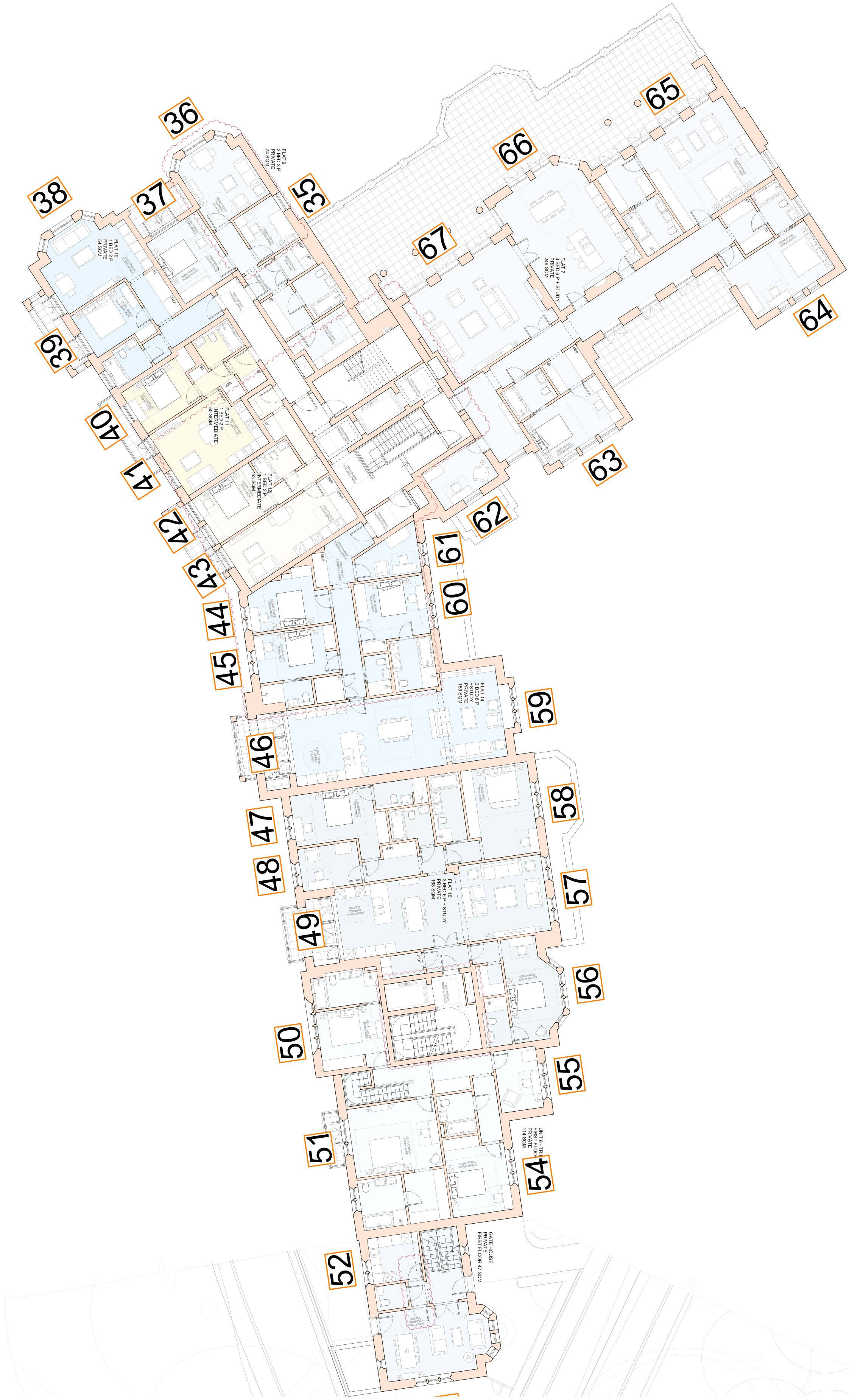


Fig. 03: Floor Plan

Second Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION			SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC		ANNUAL	WINTER
SECOND FLOOR							
68	Study	2.4	91	MET			
69	Living Room	4.4	100	N/A		67	23
70	Bedroom	1.3	94	MET			
71	L/K/D	4.1	99	N/A		83	30
72	Bedroom	1.4	97	MET			
73	Bedroom	1.9	97	MET			
74	Living Room	2.4	99	MET		57	22
75	Living Room	1.6	100	MET		33	17
76	Bedroom	1.2	95	MET			
77	Bedroom	1.9	96	MET			
78	Bedroom	2.2	96	MET			
79	Kitchen	1.3	100	N/A			
80	Bedroom	1.9	98	MET			
81	Bedroom	3	98	MET			
82	Kitchen	1.6	100	N/A			
83	Bedroom	3.9	98	MET			
84	Living Room	1.7	99	MET		14	14
85	Kitchen	1.7	97	MET			
86	Bedroom	4.4	97	MET			
87	Bedroom	2.6	90	MET			
88	Bedroom	2.6	98	MET			
89	Bedroom	4.1	99	N/A			
90	Living Room	2.4	100	N/A			
91	Bedroom	2	92	MET			
92	Living Room	1.5	100	N/A			
93	Bedroom	2.5	98	MET			
94	Study	2.6	96	MET			

Table 05: Assessment Data

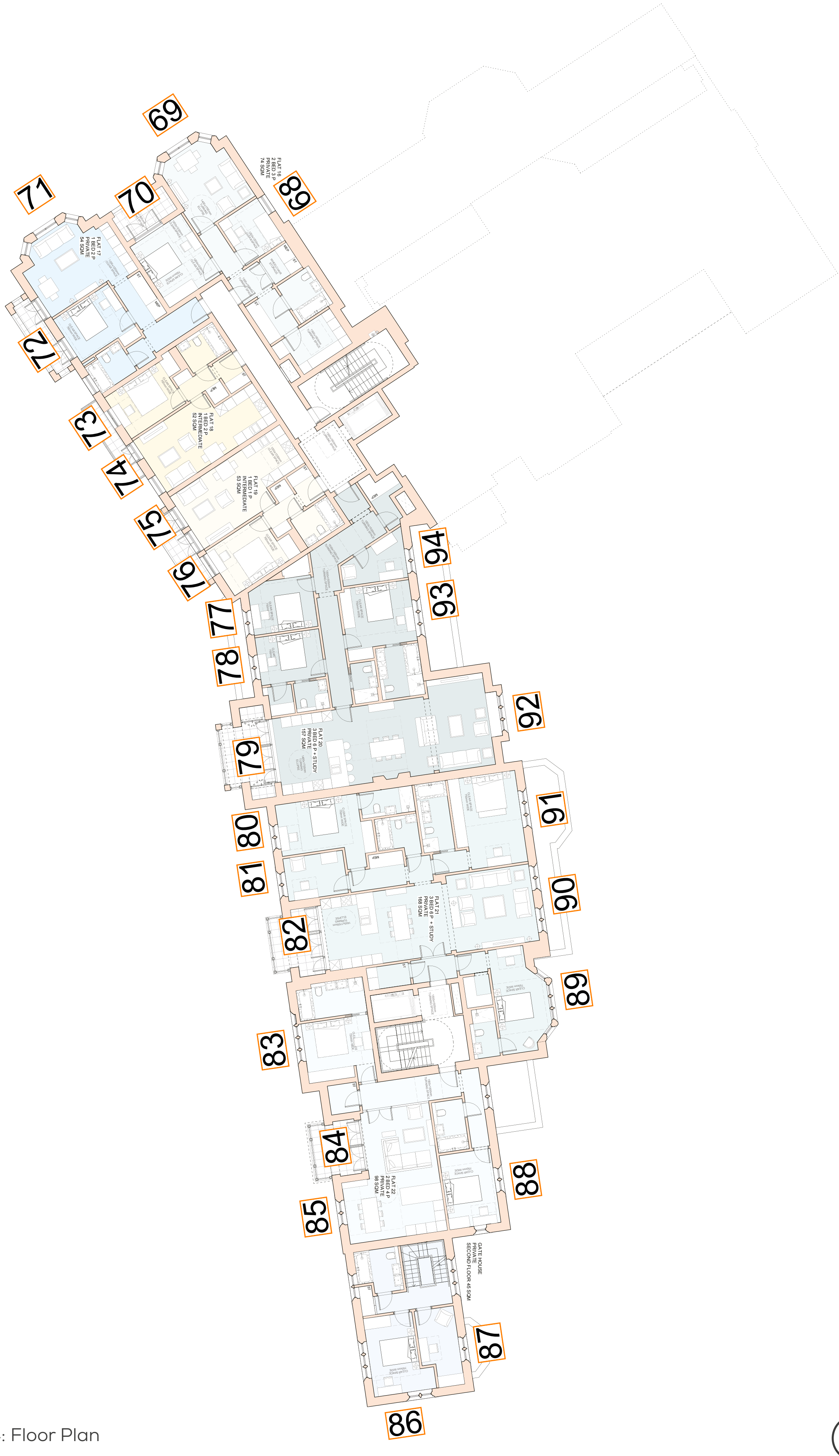


Fig. 04: Floor Plan

Third Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
THIRD FLOOR						
95	Living Room	4.3	99	N/A	55	18
96	Bedroom	2.6	93	MET		
97	Bedroom	3.9	99	N/A		
98	Bedroom	2.4	97	MET		
99	Bedroom	2.4	97	MET		
100	Living Room	2.6	99	MET	65	23
101	Living Room	1.6	100	MET	33	17
102	Bedroom	1.2	95	MET		
103	Bedroom	1.8	99	MET		
104	Bedroom	1.3	92	MET		
105	Kitchen	1.5	100	MET		
106	Bedroom	2.1	97	MET		
107	Bedroom	3.1	98	MET		
108	Kitchen	1.8	100	MET		
109	Living Room	2	94	MET	72	28
110	Kitchen	1.4	97	MET		
111	Bedroom	1.4	94	N/A		
112	Bedroom	2.2	100	N/A		
113	Bedroom	0.6	79	MET		
114	Bedroom	1.9	93	MET		
115	Living Room	2	100	MET		
116	Bedroom	1.8	92	MET		
117	Living Room	2.3	100	MET		
118	Bedroom	2.9	95	N/A		
119	Study	2.5	96	MET		
120	Bedroom	6.3	99	MET		
121	Bedroom	3.9	98	N/A		
122	Bedroom	4.4	99	N/A		
123	L/K/D	3.8	100	MET	71	23
124	Living Room	2.8	99	MET	55	16

Table 06: Assessment Data

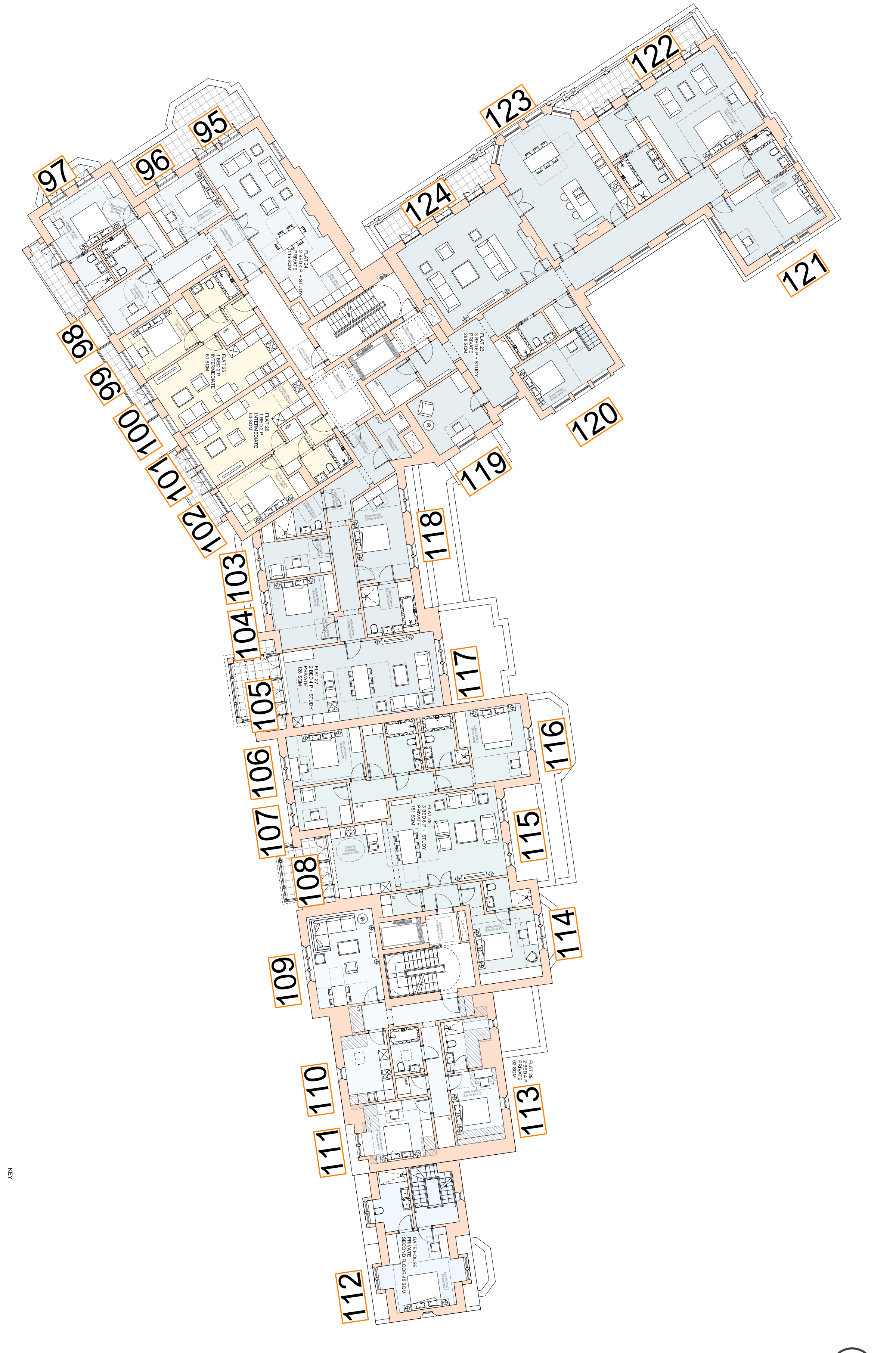


Fig. 05: Floor Plan

Fourth Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION			SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC		ANNUAL	WINTER
FOURTH FLOOR							
125	L/K/D	2.3	98	N/A		99	30
126	Bedroom	1.4	92	MET			
127	Bedroom	1.5	92	MET			
128	Bedroom	1.4	91	MET			
129	Bedroom	1.2	96	MET			
130	Bedroom	1.9	83	MET			
131	Bedroom	2.5	94	MET			
132	L/K/D	1.5	95	MET		72	28
133	Bedroom	1.1	94	MET			
134	L/K/D	2.8	100	N/A		96	29
135	Bedroom	0.8	91	MET			
136	L/K/D	2.7	100	N/A		68	8
137	Bedroom	3.6	100	MET			
138	Study	2.7	98	MET			
139	Bedroom	2.3	98	MET			
140	Bedroom	3.5	99	N/A			
141	Bedroom	1.9	99	MET			
142	L/K/D	2.3	98	MET		59	20
143	Living Room	1.5	95	MET		59	21

Table 07: Assessment Data

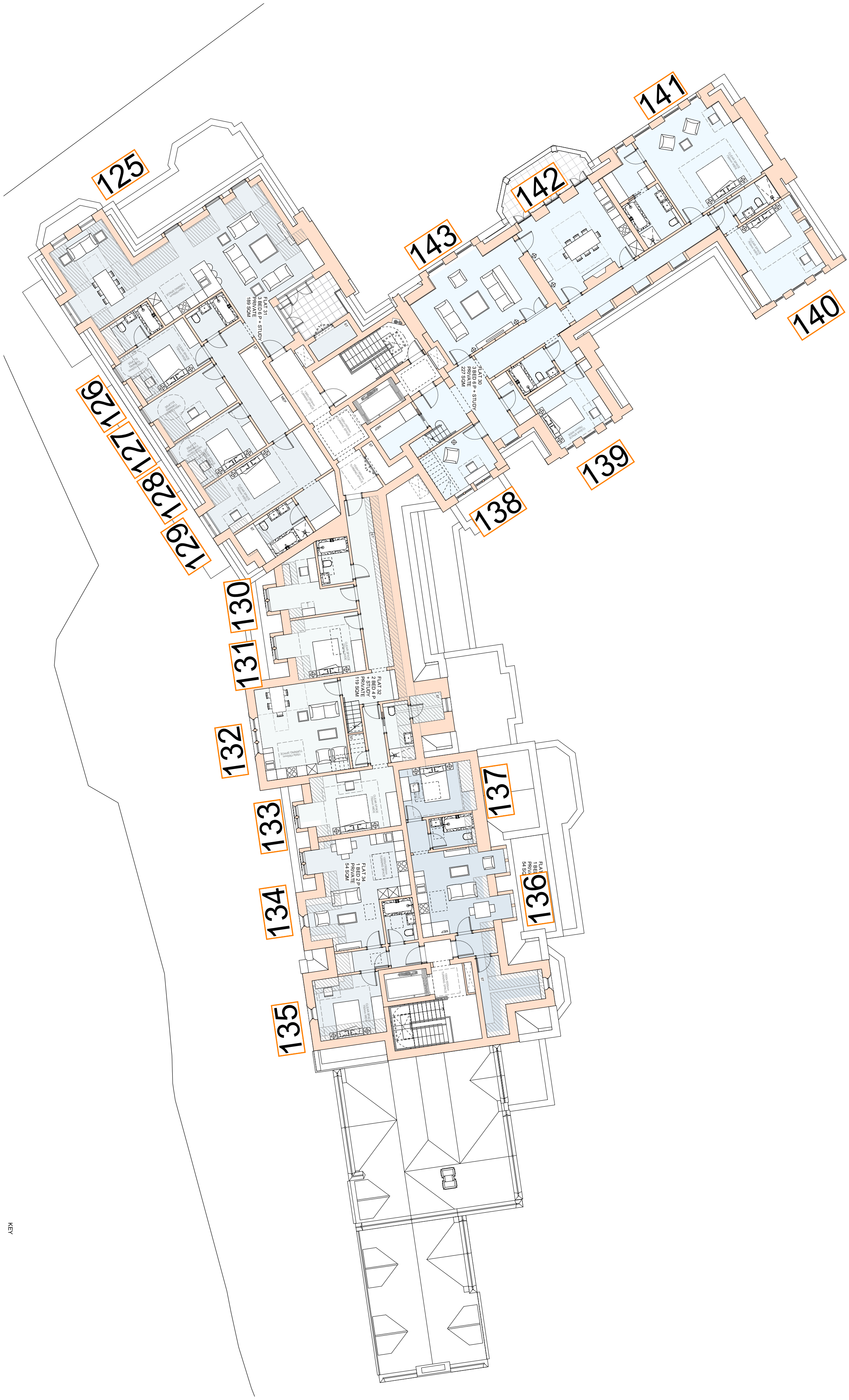
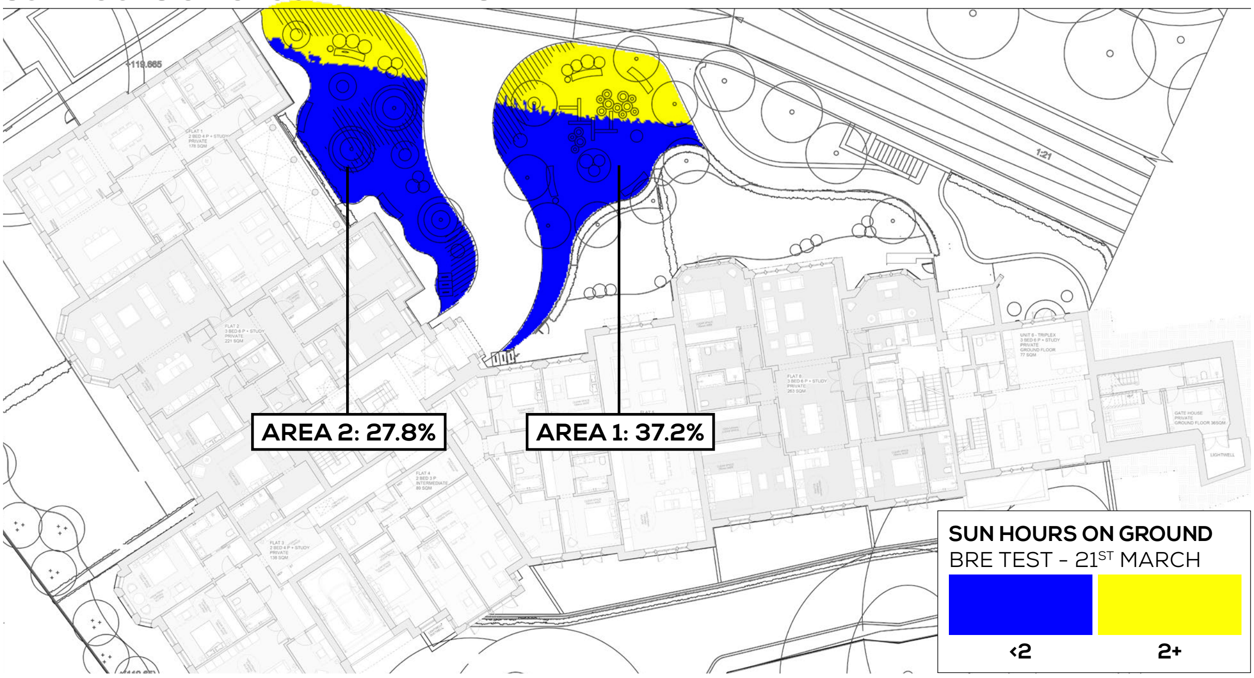


Fig. 06: Floor Plan

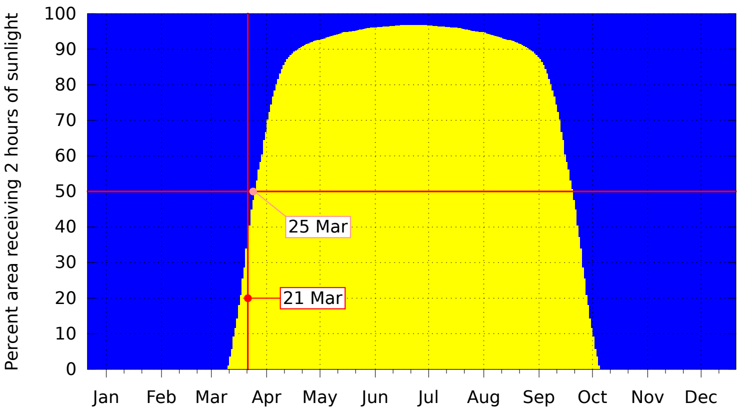
7 OVERSHADOWING ASSESSMENTS

OVERSHADOWING ASSESSMENT - PROPOSED SCENARIO - COMMUNAL OPEN SPACE

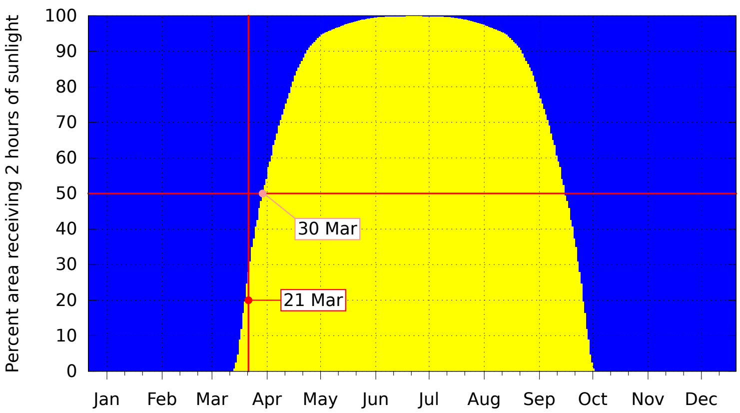
SUN HOURS ON GROUND - BRE TEST



(BRE RECOMMENDS 2+ HOURS OF SUNLIGHT ON 21ST MARCH FOR AT LEAST 50% OF THE OPEN SPACE)



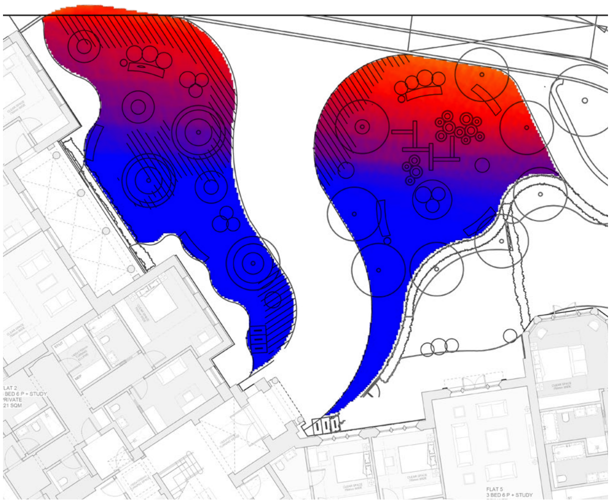
Area 1 - BRE test throughout the year



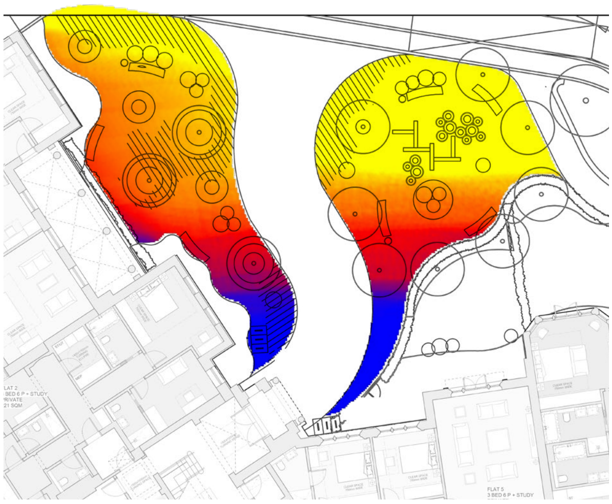
Area 2 - BRE test throughout the year

OVERSHADOWING ASSESSMENT - COMMUNAL OPEN SPACE
SUN HOURS ON GROUND - SUN EXPOSURE THROUGHOUT THE SUMMER MONTHS

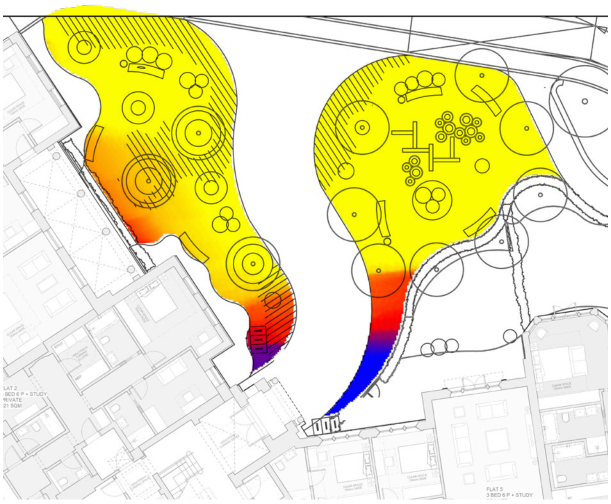
21ST MARCH
(21ST SEPTEMBER)



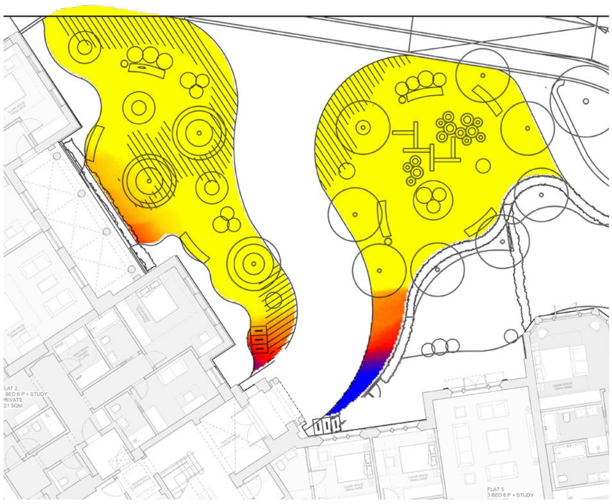
21ST APRIL
(21ST AUGUST)



21ST MAY
(21ST JULY)



21ST JUNE



SUN EXPOSURE
TOTAL HOURS

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5 5.5 6.0+

ADDRESS
THE WHITEHOUSE
BELVEDERE ROAD
LONDON SE1 8GA

CONTACT
T 020 7202 1400
F 020 7202 1401
mail@gia.uk.com

WWW.GIA.UK.COM

gia