gia CHARTERED SURVEYORS

DAYLIGHT & SUNLIGHT

INTERNAL DAYLIGHT AND SUNLIGHT REPORT

Harrington Square, London

Salboy

17 July 2023

GIA No: **19492**

PROJECT DATA:

Client	**Salboy**
Architect	**Studio Power**
Project Title	**Harrington Square, London**
Project Number	**19492**

REPORT DATA:

Report Title	**Internal Daylight and Sunlight Assessments**
GIA Department	**Daylight Department**
Dated	**17 July 2023**

Prepared by	**PDA**
Checked by	**GL**
Type	**Planning**

Revisions	No:	Date:	Notes:	Signed:

DISCLAIMER:

N.B This report has been prepared for Salboy by GIA as their appointed Daylight & Sunlight consultants. This report is intended solely for Salboyand may contain confidential information. No part or whole of its contents may be disclosed to or relied upon by any Third Parties without the express written consent of GIA. It is accurate as at the time of publication and based upon the information we have been provided with as set out in the report. It does not take into account changes that have taken place since the report was written nor does it take into account private information on internal layouts and room uses of adjoining properties unless this information is publicly available.

SOURCES OF INFORMATION:

Information Received	**IR-10-19492**
Release Number	**Rel_04_19492_DSD**
Issue Number	**02**
Site Photos	**GIA**
3D models	**VU.CITY**
OS Data	**FIND Maps**

CONTENTS

1 INTRODUCTION 2

2 RELEVANT GUIDANCE 3

3 SIMULATION ASSUMPTIONS 8

4 CONCLUSIONS 10

5 SITE OVERVIEW 12

6 INTERNAL DAYLIGHT AND SUNLIGHT ASSESSMENTS 14

1 INTRODUCTION

GIA has been instructed to provide a report upon the potential availability of Daylight and Sunlight to the proposed accommodation within the residential scheme at Harrington Square, Camden. GIA was specifically instructed to carry out the following:

- To create a 3D computer model of the proposal based upon drawings prepared by Studio Power.
- Carry out a daylight assessment for the illuminance method.
- Carry out a sunlight assessment.
- Prepare a report setting out the analysis and our findings.

2 RELEVANT GUIDANCE

The Building Research Establishment (BRE) have set out in their handbook 'Site Layout Planning for Daylight and Sunlight a Guide to Good Practice (BR 209 2022)', guidelines and methodology for the measurement and assessment of daylight and sunlight within proposed buildings.

2.1 INTRODUCTION

The BRE published the new edition of 'Site layout planning for daylight and sunlight: a guide to good practice' in June 2022 (BR 209), This is to be read in conjunction with BS EN 17037:2018 "Daylight in buildings", the UK National Annex of the British Standard and the CIBSE publication LG 10 'Daylighting – a guide for designers'.

The BR 209 new edition contains amended methodologies for appraising the daylight and sunlight quality within new developments. Nonetheless, the main aim of the guidance is maintained: *"to help rather than constrain the designer"* as stated in Paragraph 1.5 of the new guidance.

The report provides advice, but also clearly states that it *"is not mandatory and the guide should not be seen as an instrument of planning policy."* The guidance also acknowledges in its introduction that *"Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design (see Section 5). In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high-rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings."* (Paragraph 1.6)

2.2 BS EN 17037:2018 AND THE UK ANNEX

The British Standard BS8206-2:2008 was superseded by the new European Standard on daylight BS EN 17037:2018 "Daylight in buildings".

Following on from the review of the European Standard by a dedicated commission of UK experts, the British Standard Institution appended to BS EN 17037:2018 a UK National Annex which brings the recommended light levels in line with those of the former BS8206-2:2008.

The BS EN 17037 includes four criteria: daylighting, views, sunlight access and glare. Daylighting and sunlight access are considered relevant for residential buildings and therefore discussed within this report.

View out and Glare are not solely but mostly relevant in offices and schools, where occupants are more fixed to a certain location within a room. In residential habitable rooms, occupants tend to move more freely and therefore view out and glare are not assessed within residential buildings.

In relation to sunlight access, the assessment considers the hours of sunlight reaching a window on the 21st March.

2.3 DAYLIGHT

The BRE set out the methods for assessing daylight within a proposed building within section 2.1 and Appendix C of the handbook. This is based on the methods detailed in the BS EN 17037.

BS EN 17037 suggests two possible methodologies for appraising daylight:

- Illuminance Method
- Daylight Factor Method

These methodologies are discussed in more detail below.

Whilst Vertical Sky Component (VSC) is no longer directly used to calculate the levels of daylight indoors, this is still referenced within the BRE guidance as a metric to appraise the level of obstruction faced by a building and the potential for good daylight indoors.

This method of assessment may also be used to appraise the daylight quality in the early stages of the design, when room layouts or window locations are still undecided.

Vertical Sky Component (VSC)

This method of assessment can be undertaken using a skylight indicator or a Waldram diagram manually or most commonly through the use of specialist daylighting software. 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.

Illuminance method

Climate Based Daylight Modelling (CBDM) is used to predict daylight illuminance using sun and sky conditions derived from standard meteorological data (often referred to as climate or weather data). This analytical method allows the prediction of absolute daylight illuminance based on the location and building orientation, in addition to the building's daylight systems (shading systems, for example). Annex A within the BS EN 17037 proposes values of target illuminances and minimum target illuminances to exceed 50 % of daylight hours.

This is considered to be the most accurate approach when using climate data, however, it provides a very large amount of data for each assessed room, which then needs to be interrogated. One of the methodologies that can be used to interrogate this data is Spatial Daylight Autonomy (sDA).

Spatial Daylight Autonomy (sDA)

The sDA assessment is designed to understand how often each point of the room's task area sees illuminance levels at or above a specific threshold.

BS EN 17037 sets out minimum illuminance levels (300lx) that should be exceeded over 50% of the space for more than half of the daylight hours in the year. It also includes recommendations for medium and high daylighting levels within a space (500lx and 700lx respectively). It should be noted here, however, that these targets are specified irrespective of a space's use or design.

The National Annex suggests that these targets can be challenging to achieve within residential settings, particularly in areas of higher density and so suggests lower targets can be considered in this situation. It should be noted here that the reduced targets suggested within the BS EN 17037:2018 National Annex are provided so as to be comparable with the previous BR209's recommendations for ADF. These targets are:

- 100 lux for bedrooms
- 150 lux for living rooms
- 200 lux for living/kitchen/diners, kitchens, and studios.

It is however stated in paragraph C17 of the BRE that: *"Where a room has a shared use, the highest target should apply. For example in a bed sitting room in student accommodation, the value for a living room should be used if students would often spend time in their rooms during the day. Local authorities could use discretion here. For example, the target for*

a living room could be used for a combined living/dining/kitchen area if the kitchens are not treated as habitable spaces, as it may avoid small separate kitchens in a design".

Daylight Factor method

This method involves calculating the median daylight factor on a reference plane (assessment grid).

"The daylight factor is the illuminance at a point on the reference plane in a space, divided by the illuminance on an unobstructed horizontal surface outdoors. The CIE standard overcast sky is used, and the ratio is usually expressed as a percentage."

This method of assessments considers an overcast sky, and therefore the orientation and location of buildings is not relevant. In order to account for different climatic conditions, Annex A within the BS EN 17037 sets equivalent daylight factor targets (D) for various locations in Europe.

The median daylight factor (MDF) should meet or exceed the target daylight factor relative to a given illuminance for more than half of daylight hours, over 50% of the reference plane.

2.4 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 minimising 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. Furthermore, 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 EN 17037 criterion that the minimum duration of sunlight exposure in at least one habitable room of a dwelling should be 1.5 h on March 21st. Table A.5 also establishes medium and high sunlight targets (3 and 4 hours).

This is to be checked at a reference point located centrally to the window's width and at the inner surface of the aperture (façade and/or roof). For multiple apertures in different façades it is possible to cumulate the time of sunlight availability if not occurring at the same time. The reference point is minimum 1.2 m above the floor and 0.3 m above the window sill if present.

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*

- *a habitable room, preferably a main living room, can receive a total of at least 1.5 hours of sunlight on 21 March. This is assessed at the inside centre of the window(s); sunlight received by different windows can be added provided they occur at different times and sunlight hours are not double counted.. "*

2.5 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 and around buildings has an important impact on the overall appearance and ambience 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 that can receive two hours of sun on 21 March is less than 0.80 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.."

2.6 FURTHER RELEVANT INFORMATION

CIBSE LG 10 'Daylighting – a guide for designers'.

This guide details the process of designing for daylighting. It outlines considerations of form, orientation, and other aspects involved in designing the building envelope to optimise natural light.

The guidance in this document is written primarily for buildings located within the UK, and will be most applicable to projects in northern hemisphere. However, the principles are universal, and can be applied to other locations if the appropriate weather data is used and local standards and regulations are respected

Page intentionally left blank

3 SIMULATION ASSUMPTIONS

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.

Calculation model

The three dimensional representation of the proposed development has been modelled using the drawings prepared by Studio Power, received by GIA in August 2022. These have been placed in the context of their 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 façades, internal and external spaces, considering all of the surrounding obstructions and orientation.

The weather file recorded at Gatwick Airport was considered the most relevant for this assessment.

Surfaces reflectance

The reflectance value applied to surfaces in the computational modelling are typical of residential uses. Assumptions applied are as follow:

- Interior walls - 0.7
- Ceilings - 0.8
- Floors - 0.4
- Exterior ground and external obstructions - 0.2

Assessment Grids

For the daylight assessments, an analysis 'grid' is located within each room at working plane height (850 mm from FFL) and offset by 0.3m from the walls as recommended by BR 209.

Grid points are spaced by 0.2m.

Assessment Resolution

The climate-based daylight assessments have been undertaken on an hourly basis whilst the sunlight exposure assessment has been undertaken for every minute on the relevant days.

Glazing transmittance

A glazing visible light transmittance (VLT) of 70% has been used as in agreement with the wider design team. A framing factor has been taken from the elevations supplied. Maintenance factors have been applied as per BR209 with 0.92 for windows not beneath an overhang and 0.76 for windows beneath an overhang.

The final transmittance values are shown in the table below.

	GLAZING NAME	TV (NORMAL)	TABLE NA.2	TABLE NA.3	TABLE NA.4	FRAMING FACTOR	TV (TOTAL)
	TYPE 1	0.70	8	1	1	0.75	0.48
	TYPE 2	0.70	8	1	3	0.75	0.40
	TYPE 3	0.70	8	1	1	0.85	0.55

Table 01: Transmittance and maintenance factors

3.1 GLASS TRANSMITTANCE - WINDOW MAPS

Fig. 01: South-east view

Fig. 02: South-west view

1 2 3

4 CONCLUSIONS

The purpose of this report is to ascertain whether the proposed development at Harrington Square, Camden, will offer acceptable daylight and sunlight amenity for the enjoyment of future occupants.

The proposal has been designed by Studio Power and seeks to deliver a total of 11 new residential units to respond to the growing housing needs in the area. The site is currently occupied by an underutilised car park which has been deemed surplus to requirements and suitable for infill redevelopment by the Council.

In terms of daylight and sunlight specifically, the proposal abuts the four storey terraced properties at 1-5 Hurdwick Place to the north, and therefore windows have been located on the western, southern and eastern facades. The western façade faces the Greater London House immediately opposite the site, whist the daylight and sunlight potential on the eastern façade is constrained by the neighbouring properties at Hurdwick House and along Eversholt Street. The southern façade, instead, remains relatively unobstructed facing the Harrington Square Gardens.

It is important to note, however, that natural light is only one of the many design concerns to take into account when designing a building and it must be balanced with other relevant factors such as overheating, provision of private amenity in the form of balconies and privacy issues.

This is acknowledged by BRE, which explains the advisory nature of the BRE Guidelines in section 1.6 of its handbook:

"The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy. ... Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design. In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre... a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings."

The results presented in this report are therefore not meant to be interpreted as a strict pass/fail test, they should instead be appreciated considering the Site's constraints and aspirations.

In order to inform on the daylight and sunlight performance of the scheme, all proposed habitable rooms have been tested for spatial Daylight Autonomy (sDA) and sunlight exposure as suggested by BRE. The results of these assessments are shown on Section 6 of this report.

For daylight, rooms have been tested against the sDA targets set out within the UK National Annex (UKNA) on BS EN 17037:2018. sDA is a climate-based metric which represents the portion of a space achieving a certain illuminance target (measured in lux) for more than half of the daylight hours in the year. The recommendation within BR 209 and EN 17037 is for at least 50% of the spaces to achieve a given illuminance target based on the room use.

For sunlight, BRE suggest that at least one room per unit, preferably a living room, should receive at least 1.5 hours of direct sunlight on the 21st March.

4.1 CONCLUSIONS ON DAYLIGHT

32 out of the 37 habitable rooms (87%) will meet or exceed the minimum levels of sDA recommended by BRE and are therefore considered to offer very good daylight amenity. The majority of these rooms see sDA levels well above recommendation.

The five rooms falling short of recommendation are two bedrooms and three combined living/kitchen/dining (LKD) rooms located in the most constrained areas of the façade. The performance of these rooms is discussed in more detail below.

The two bedrooms (rooms 16 and 25) falling short of guidance are both located within units where daylight has been prioritised in the living spaces, where natural light is typically most appreciated. Furthermore, both form part of three-bedroom units where the other rooms well exceed the minimum recommended sDA levels. Therefore future occupants will be able to enjoy good daylight amenity overall.

Of the three LKDs (rooms 2, 14 and 26) falling short of guidance, two of them (rooms 2 and 26) do so only marginally seeing 49.9% and 47.6% sDA, where 50% is recommended. This difference is unlikely to be perceived by future occupants and, therefore, these rooms can be considered acceptably well-lit. The remaining LKD falling short of guidance is located on the north-eastern oriented unit on the

first floor, which naturally has lower daylight potential, and is also obstructed by Hurdwick House and the properties along Eversholt Street. Furthermore, this room is located behind a generously sized inset balcony, inherently reducing the ingress of natural light whilst providing private outdoor amenity which is usually considered an acceptable trade-off in modern apartment blocks.

Overall, it can be concluded that the proposed design performs very well in terms of daylight, whilst balancing natural lighting with other design constraints such as the provision of outdoor private amenity and privacy issues.

CONCLUSIONS ON SUNLIGHT

In terms of sunlight, 10 out of 11 units will have access to a well sun lit living space, well exceeding the minimum of 1.5 hours of sunlight recommended within the BRE. The one unit seeing lower levels of sunlight is the north-eastern oriented unit located on the first floor which naturally has lower sunlight expectation and is also obstructed by the neighbouring buildings and inset balcony located at the front. Nevertheless, future occupants will still be able to enjoy direct sunlight from their balcony and therefore this unit can be considered to offer acceptable sunlight amenity overall. As such, the proposed scheme is considered to perform very well in terms of sunlight.

In conclusion, the scheme is considered to perform very well and future occupants will be able to enjoy very good daylight and sunlight amenity overall.

5 SITE OVERVIEW

Fig. 03: Top view

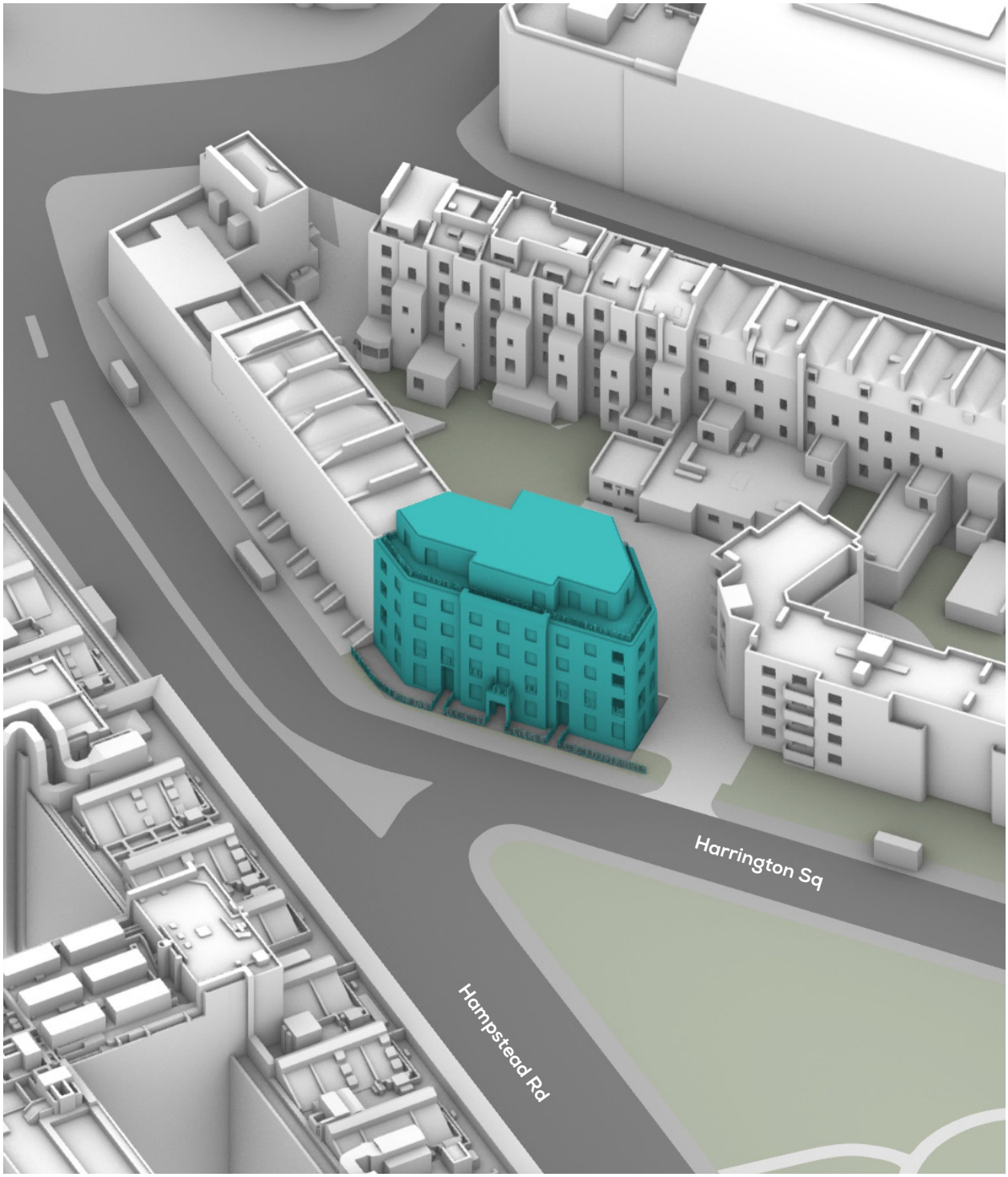


Fig. 04: Perspective view

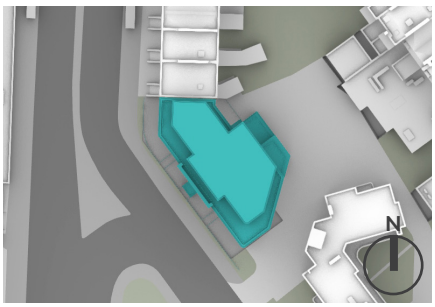
6 INTERNAL DAYLIGHT AND SUNLIGHT ASSESSMENTS

Ground Floor

ROOM REF.	ROOM USE	DAYLIGHT					SUNLIGHT
		percentage of room achieving target illuminance for 2190 hrs (50% of daylit hours)					HOURS:MIN
		100	150	200	TARGET	RELEVANT ENSDA	21 MAR
HARRINGTON SQ - GROUND FLOOR							
1	BEDROOM	100.0	72.5	57.5	100	100.0	00:43
2	L/K/D	88.2	62.7	49.9	200	49.9	03:04
3	BEDROOM	100.0	97.7	83.9	100	100.0	03:13
4	L/K/D	100.0	100.0	97.5	200	97.5	05:54
5	BEDROOM	72.6	42.7	29.2	100	72.6	00:00
6	BEDROOM	79.2	56.6	41.6	100	79.2	00:00
7	BEDROOM	70.4	43.5	31.2	100	70.4	00:00

Table 01: Assessment Data

Fig. 05: Floor Plan



First Floor

ROOM REF.	ROOM USE	DAYLIGHT					SUNLIGHT
		percentage of room achieving target illuminance for 2190 hrs (50% of daylit hours)					HOURS:MIN
		100	150	200	TARGET	RELEVANT ENSDA	21 MAR
HARRINGTON SQ - FIRST FLOOR							
8	L/K/D	100.0	95.2	70.8	200	70.8	03:15
9	BEDROOM	100.0	81.0	64.2	100	100.0	03:20
10	BEDROOM	100.0	100.0	76.1	100	100.0	03:22
11	BEDROOM	100.0	96.2	84.1	100	100.0	03:26
12	L/K/D	100.0	99.7	74.0	200	74.0	05:48
13	BEDROOM	51.9	24.0	16.9	100	51.9	00:37
14	L/K/D	48.9	19.1	10.4	200	10.4	00:15
15	BEDROOM	100.0	100.0	99.5	100	100.0	00:13
16	BEDROOM	0.0	0.0	0.0	100	0.0	00:00

Table 01: Assessment Data

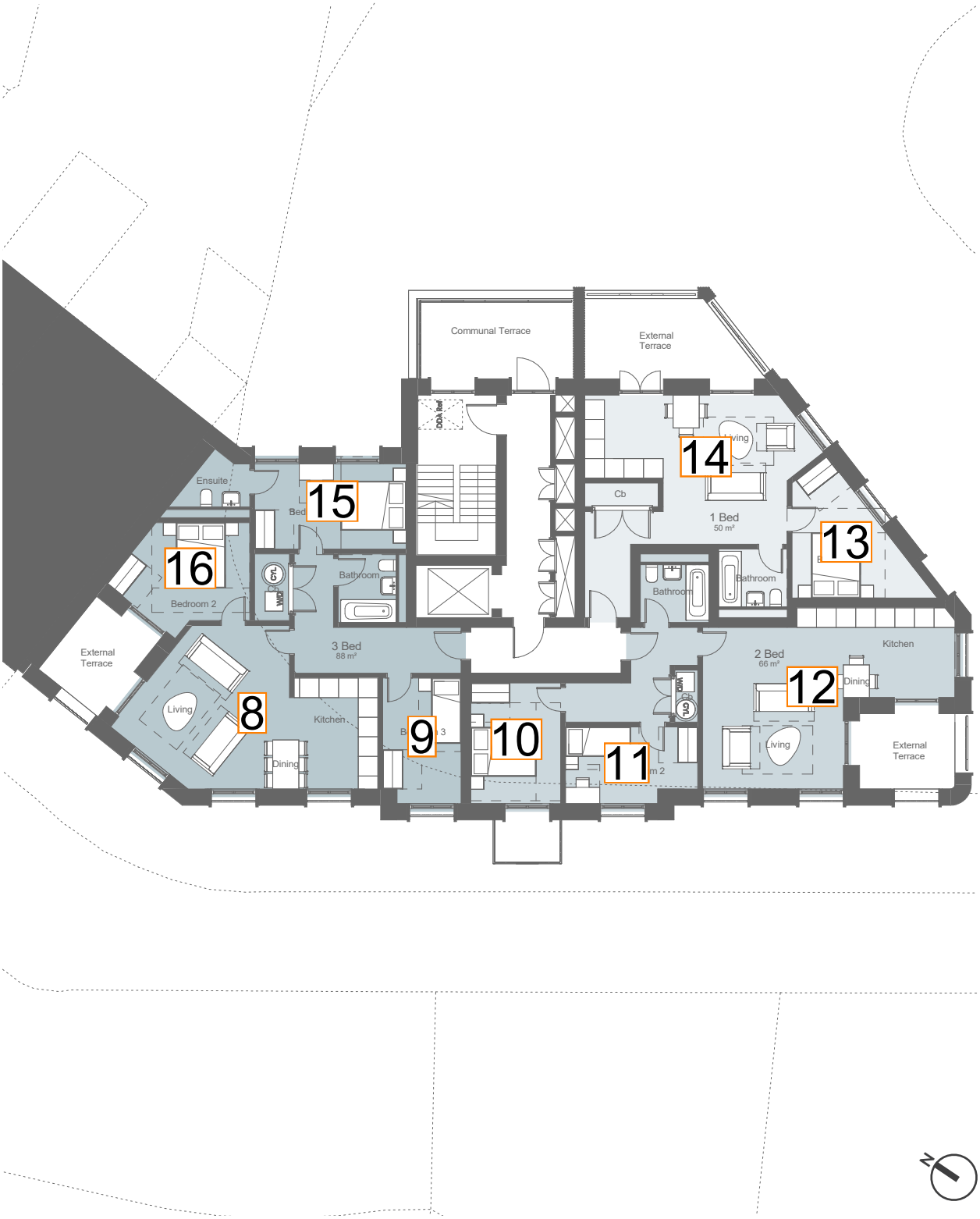
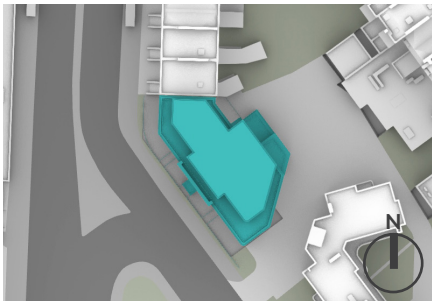


Fig. 06: Floor Plan

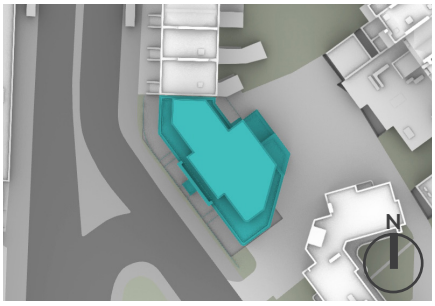


Second Floor

ROOM REF.	ROOM USE	DAYLIGHT					SUNLIGHT
		percentage of room achieving target illuminance for 2190 hrs (50% of daylit hours)					HOURS:MIN
		100	150	200	TARGET	RELEVANT ENSDA	21 MAR
HARRINGTON SQ - SECOND FLOOR							
17	L/K/D	100.0	99.1	86.2	200	86.2	03:35
18	BEDROOM	100.0	100.0	78.8	100	100.0	03:40
19	BEDROOM	100.0	100.0	82.2	100	100.0	03:45
20	BEDROOM	100.0	98.5	91.7	100	100.0	03:50
21	L/K/D	100.0	100.0	99.8	200	99.8	07:15
22	BEDROOM	92.3	73.2	44.8	100	92.3	01:34
23	L/K/D	100.0	100.0	100.0	200	100.0	02:24
24	BEDROOM	100.0	100.0	100.0	100	100.0	00:33
25	BEDROOM	0.0	0.0	0.0	100	0.0	00:00

Table 01: Assessment Data

Fig. 07: Floor Plan



Third Floor

ROOM REF.	ROOM USE	DAYLIGHT					SUNLIGHT
		percentage of room achieving target illuminance for 2190 hrs (50% of daylit hours)					HOURS:MIN
		100	150	200	TARGET	RELEVANT ENSDA	21 MAR
HARRINGTON SQ - THIRD FLOOR							
26	L/K/D	62.8	53.9	47.6	200	47.6	03:50
27	BEDROOM	100.0	100.0	100.0	100	100.0	03:56
28	BEDROOM	100.0	100.0	100.0	100	100.0	04:05
29	BEDROOM	100.0	100.0	85.4	100	100.0	04:14
30	L/K/D	100.0	100.0	96.2	200	96.2	09:11
31	BEDROOM	100.0	100.0	100.0	100	100.0	04:22
32	BEDROOM	100.0	100.0	79.9	100	100.0	00:52
33	BEDROOM	100.0	100.0	100.0	100	100.0	00:53

Table 01: Assessment Data

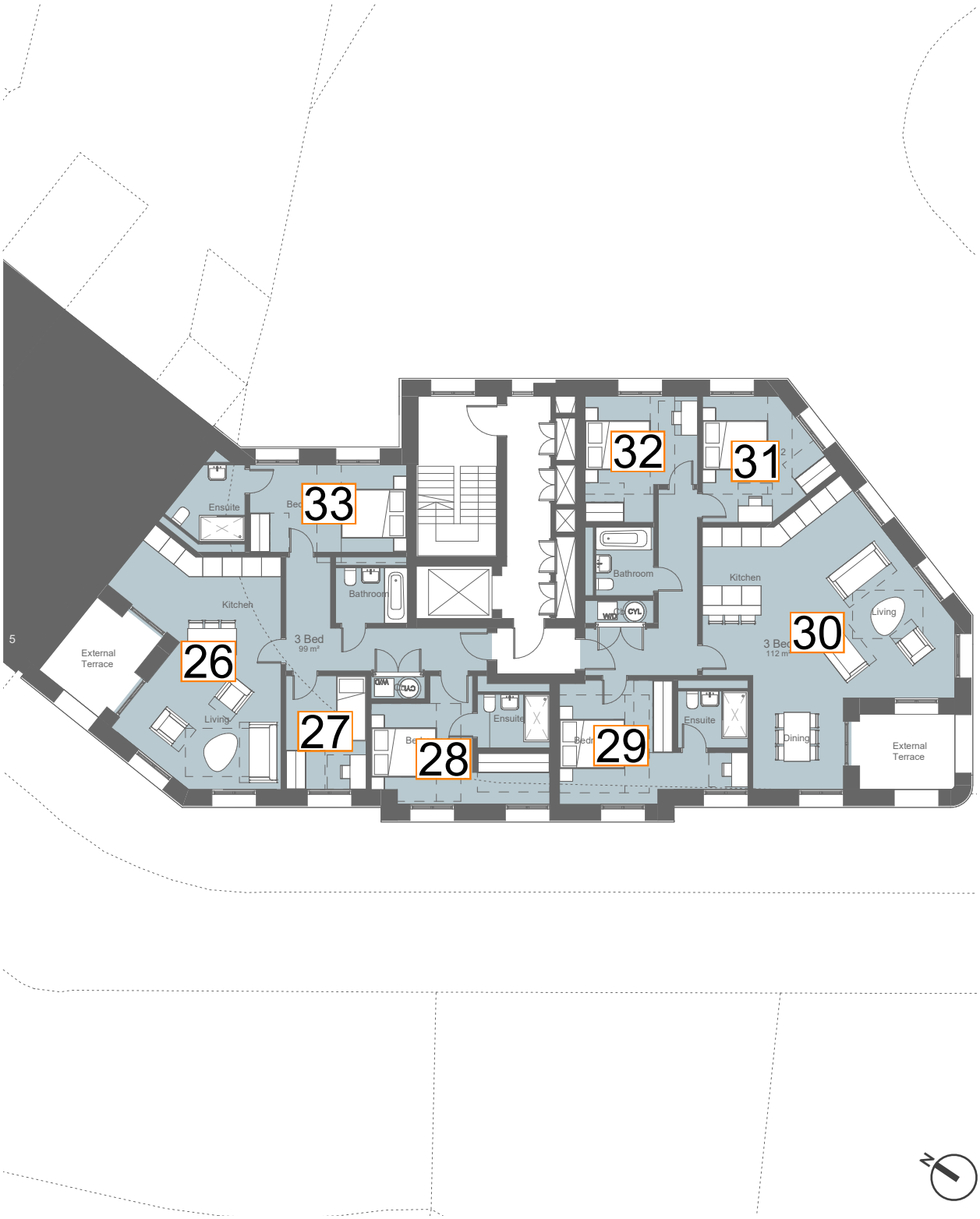
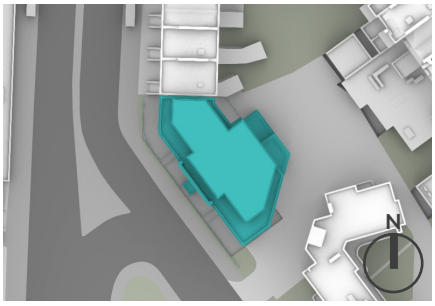


Fig. 08: Floor Plan



Fourth Floor

ROOM REF.	ROOM USE	DAYLIGHT					SUNLIGHT
		percentage of room achieving target illuminance for 2190 hrs (50% of daylit hours)					HOURS:MIN
		100	150	200	TARGET	RELEVANT ENSDA	21 MAR
HARRINGTON SQ - FOURTH FLOOR							
34	BEDROOM	100.0	100.0	100.0	100	100.0	04:19
35	BEDROOM	100.0	70.8	50.7	100	100.0	00:00
36	L/K/D	100.0	100.0	100.0	200	100.0	10:31
37	BEDROOM	100.0	100.0	100.0	100	100.0	04:44

Table 01: Assessment Data

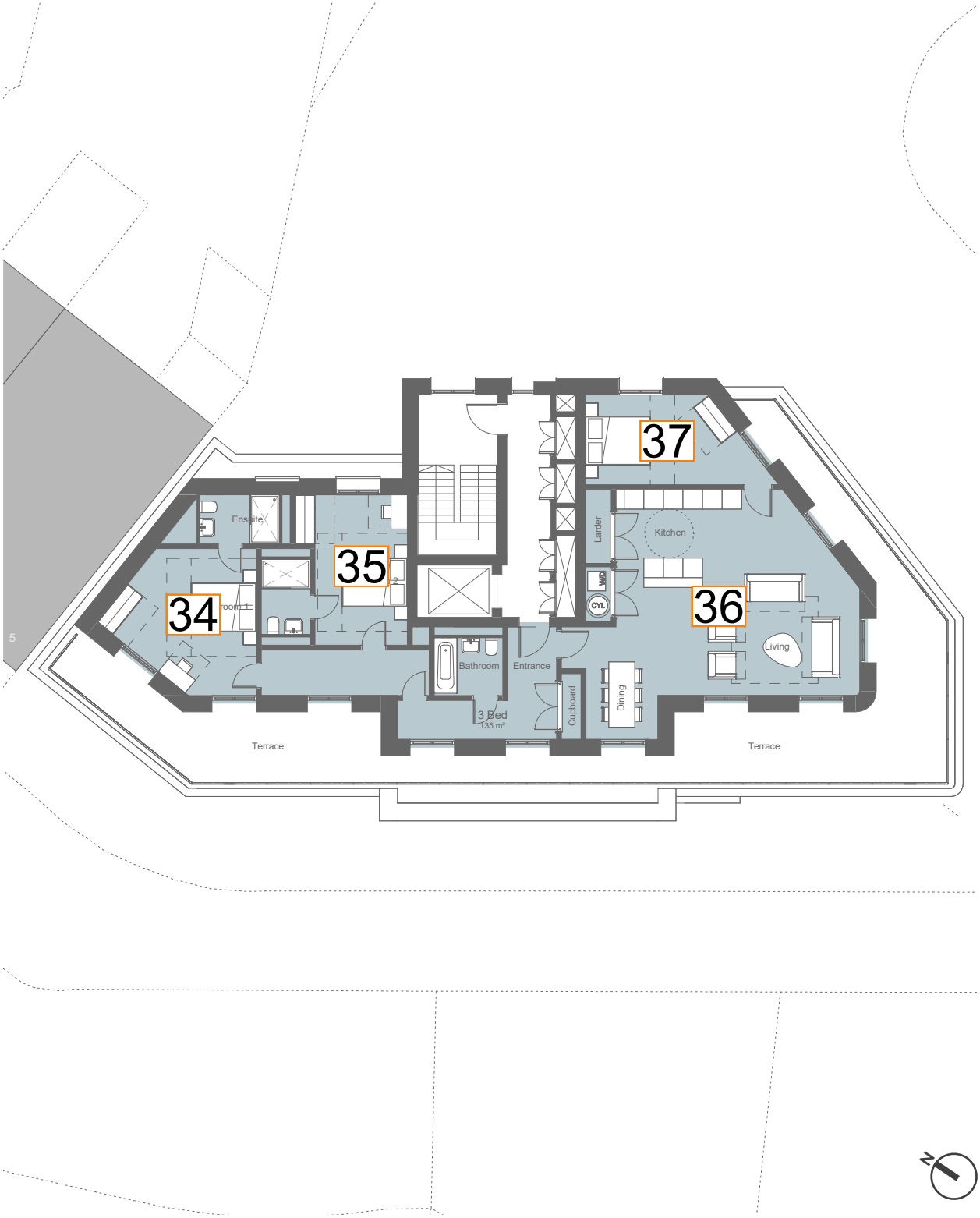
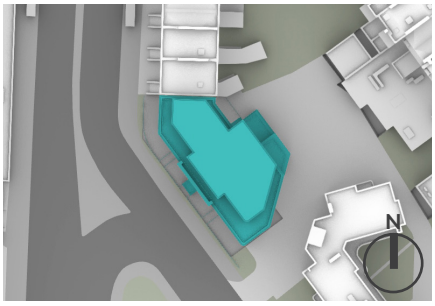


Fig. 09: Floor Plan



gia
CHARTERED SURVEYORS

For further details please contact us on:

LONDON

T 020 7202 1400
E mail@gia.uk.com

The Whitehouse
Belvedere Road
London SE1 8GA

MANCHESTER

T 0161 672 5100
E manchester@gia.uk.com

2 Commercial Street
Manchester
M15 4RQ

BELFAST

T 02892 449 674
E belfast@gia.uk.com

River House
48-60 High Street
Belfast BT1 2BE

BRISTOL

T 0117 374 1504
E bristol@gia.uk.com

33 Bristol
Colston Avenue
Bristol BS1 4UA

DUBLIN

T 020 7202 1400
E hello@giasurveyors.ie

77 Lower Camden Street
Dublin Ireland
D02 XE80