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DAYLIGHT & SUNLIGHT

INTERNAL DAYLIGHT AND SUNLIGHT REPORT

Confey, Leixlip, Co. Kildare

23 July 2026

GIA No: **24484**

PROJECT DATA:

Architect	**TEGOS**
Project Title	**Confey, Leixlip, Co. Kildare**
Project Number	**24484**

REPORT DATA:

Report Title	**Internal Daylight and Sunlight Report**
GIA Department	**Daylight Department**
Dated	**23 July 2026**

Prepared by	**RL**
Checked by	**KST**
Type	**Planning**

Revisions	No:	Date:	Notes:	Signed:

DISCLAIMER:

N.B This report 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:

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Issue Number	**01**
3D models	**TEGOS**

Map data

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1 EXECUTIVE SUMMARY

The purpose of this report is to ascertain whether the Proposed Development located in at Confey, Leixlip, Co. Kildare will provide adequate daylight and sunlight amenity to the future residents.

The Proposed Development compromises 125 residential units made up of 22 no. apartments, 22 no. duplex units and 81 no. 2-3 storey terraced houses.

To ascertain the levels of daylight and sunlight within the Proposed Development, all units within the apartment block and a representative sample of proposed duplex units have been tested. Within the sample of units tested, all habitable rooms have been assessed in accordance with the BRE Guidelines (BR209 - 2022) and the UK National Annex (UKNA) to BS EN 17037:2018.

Whilst the house typologies have not been technically assessed, given the low-rise nature of the surrounding context, their favourable orientation, appropriate layouts and generous fenestration, these units are expected to be well lit and offer acceptable daylight and sunlight amenity for future occupiers.

In terms of overshadowing, BRE suggests that open space should see at least two hours of direct sunlight on 21st March to be considered adequately sunlit throughout the year. The proposed development comprises a large linear park which extends along the southern and eastern boundaries. The linear park is largely unobstructed so will easily see in excess of two hours on direct sunlight on 21st March and does not require technical assessment.

There are no neighbouring residential properties in close enough proximity to the proposed buildings to experience a change in their light, all neighbouring properties will remain well daylit and sunlight following implementation of the proposed development.

For daylight and sunlight, a total of 26 residential units with 75 habitable rooms have been assessed. The sample of duplex units tested has been selected to represent the worst-case scenario for this typology. All other duplex units are expected to have similar or better results than those assessed.

The report contains the final assessments undertaken for the representative sample of units.

For daylight, all 75 (100%) of the assessed habitable rooms achieve the minimum levels of Median Daylight Illuminance (MDI) recommended within the BS EN 17037:2018 UKNA and the BRE Guidelines for residential buildings.

For sunlight, all 26 (100%) units tested within the Proposed Development would achieve at least 1.5 hours of sunlight at the equinox within at least one habitable room as recommended by BS EN 17037:2018 UKNA and the BRE Guidelines.

Therefore, the Proposed Development shows full compliance with the relevant guidelines for both daylight and sunlight, and can therefore be considered to offer well daylit and sunlit homes for future residents.

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2 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 (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 latest 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'.

BR 209 contains 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 latest European Standard on daylight is BS EN 17037:2018 "Daylight in buildings". Following a review by a dedicated commission of UK experts, the British Standard Institution appended a UK National Annex which noted that the new recommendations "may not be achievable for some buildings, particularly dwellings" and specifically mentions dwellings in a dense urban area or with tall trees outside. The annex goes on to suggest lower recommended light levels for dwellings, in line with those of the previous version of the British Standard, BS8206-2:2008.

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, BS EN 17037:2018 suggests that the hours of sunlight reaching a window is considered "on a selected date between February 1st and March 21st". BR209 recommends that this date is preferably the equinox (see section 3.4).

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 over 50% or more of the assessment area.

BS EN 17037 sets out minimum illuminance levels (300 lux) 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 (500 lux and 700 lux 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 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

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 TEGOS, received by GIA in July 2026. 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 Dublin was considered the most relevant for this assessment.

Surfaces reflectance

In general, the reflectance value to be applied to surfaces in the computational modelling follows the BR 209 Annex C, unless specified by the design team. The following assumptions have bee applied and confirmed appropriate by the client and design team:

- Interior walls - 0.7 (light pastel paint)
- Ceilings - 0.8 (white paint)
- Floors - 0.3 (light timber veneer)

The following surface reflectance assumptions as per BR 209 have been used:

- 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.

	BS EN 17037:2018						
	Glazing Type	TV Normal	Building Type & Atmosphere (NA.2)	Glazing Exposure (NA.3)	Glazing Dirt/Weathering (NA.4)	Framing Factor	TV Total
	Type 1	0.70	Urban (8)	Vertical (x1)	Not Sheltered (x1)	0.80	0.52
	Type 2	0.70	Urban (8)	Vertical (x1)	Not Sheltered (x1)	0.75	0.48
	Type 3	0.70	Urban (8)	Vertical (x1)	Not Sheltered (x1)	0.65	0.42
	Type 4	0.70	Urban (8)	Vertical (x1)	Sheltered (x3)	0.65	0.35
	Type 5	0.70	Urban (8)	Vertical (x1)	Not Sheltered (x1)	0.60	0.39

Table 01: Transmittance and maintenance factors

3.1 GLASS TYPES - WINDOW MAPS

Fig. 01: North view - Apartment

Fig. 03: East view - Apartment

Fig. 02: South view - Apartment

Fig. 04: West view - Apartment

1 2 3 4 5

Fig. 05: Front view - Duplex

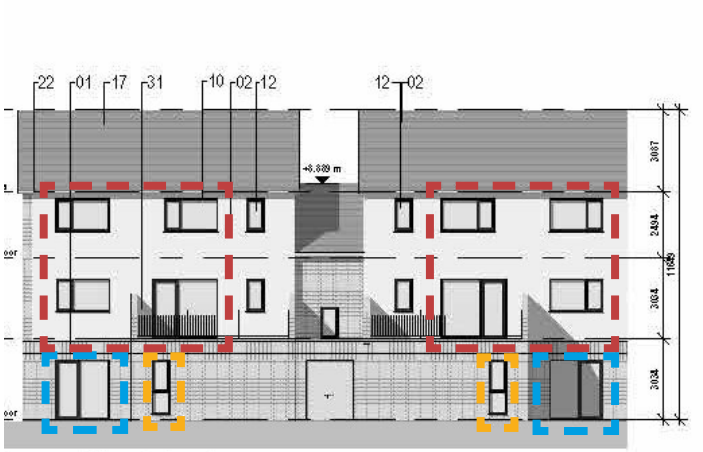

Fig. 06: Rear view - Duplex

1 2 3 4 5

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4 SITE OVERVIEW

Fig. 07: Top view

Fig. 08: Perspective view

5 INTERNAL DAYLIGHT AND SUNLIGHT ASSESSMENTS

APARTMENT

			DAYLIGHT		SUNLIGHT		
					BY ROOM		BY DWELLING
ROOM REF.	FLAT	ROOM USE	MEDIAN DAYLIGHT ILLUMINANCE (lux)	TARGET (lux)	WINDOW WITHIN 90° DUE SOUTH	21 MAR	WINDOW WITHIN 90° DUE SOUTH
APARTMENT - LEVEL 00							
1	A	L/K/D	577	200	YES	08:55	YES
2	A	BEDROOM	280	100	NO	02:42	
3	A	BEDROOM	325	100	NO	03:37	
4	B	L/K/D	202	200	NO	04:10	NO
5	B	BEDROOM	297	100	NO	02:26	
6	C	BEDROOM	343	100	NO	03:20	NO
7	C	BEDROOM	288	100	NO	03:17	
8	C	L/K/D	361	200	NO	03:51	
9	D	L/K/D	268	200	YES	01:45	YES
10	D	BEDROOM	294	100	YES	03:16	
11	D	BEDROOM	227	100	YES	03:45	
APARTMENT - LEVEL 01							
12	E	L/K/D	630	200	YES	08:47	YES
13	E	BEDROOM	299	100	NO	02:39	
14	E	BEDROOM	348	100	NO	03:45	
15	F	L/K/D	212	200	NO	04:10	NO
16	F	BEDROOM	319	100	NO	02:28	
17	G	BEDROOM	364	100	NO	03:31	NO
18	G	BEDROOM	308	100	NO	03:28	
19	G	L/K/D	388	200	NO	03:35	
20	H	L/K/D	298	200	YES	02:01	YES
21	H	BEDROOM	339	100	YES	03:16	
22	H	BEDROOM	265	100	YES	03:56	
23	I	BEDROOM	266	100	YES	04:10	YES
24	I	BEDROOM	352	100	YES	04:11	
25	I	L/K/D	473	200	YES	09:15	

Table 02: Assessment Data

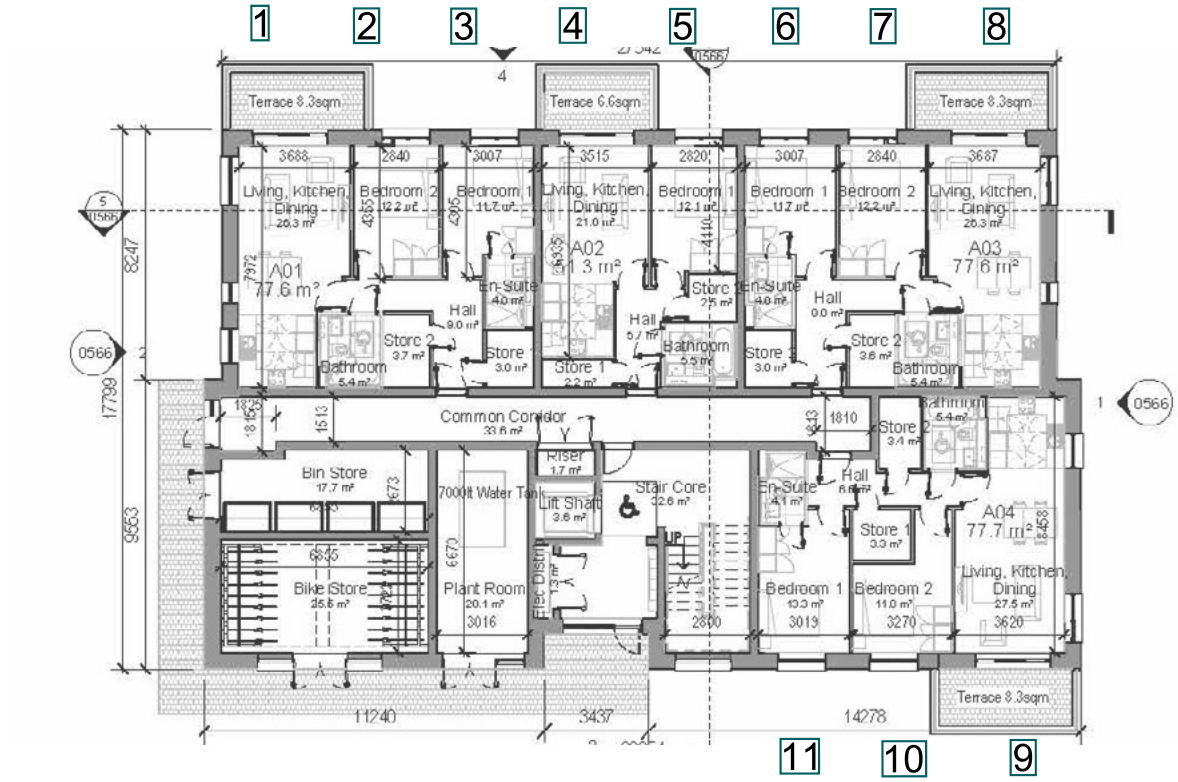
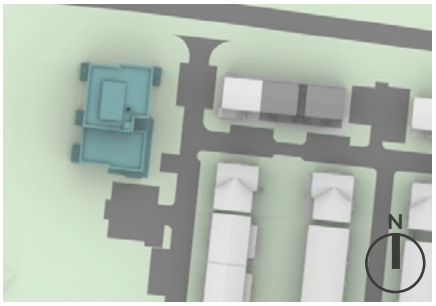


Fig. 10: Floor Plan - Level 00

Fig. 09: Floor Plan - Level 01



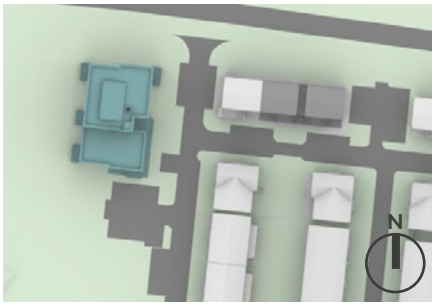
APARTMENT

ROOM REF.	FLAT	ROOM USE	DAYLIGHT		SUNLIGHT		
			MEDIAN DAYLIGHT ILLUMINANCE (lux)	TARGET (lux)	BY ROOM		BY DWELLING
					WINDOW WITHIN 90° DUE SOUTH	21 MAR	WINDOW WITHIN 90° DUE SOUTH
APARTMENT - LEVEL 02							
26	J	L/K/D	653	200	YES	08:49	YES
27	J	BEDROOM	311	100	NO	02:39	
28	J	BEDROOM	364	100	NO	03:45	
29	K	L/K/D	223	200	NO	04:20	NO
30	K	BEDROOM	328	100	NO	02:39	
31	L	BEDROOM	377	100	NO	03:42	NO
32	L	BEDROOM	319	100	NO	03:39	
33	L	L/K/D	408	200	NO	03:45	
34	M	L/K/D	326	200	YES	02:25	YES
35	M	BEDROOM	374	100	YES	03:46	
36	M	BEDROOM	293	100	YES	04:06	
37	N	BEDROOM	291	100	YES	04:18	YES
38	N	BEDROOM	381	100	YES	04:19	
39	N	L/K/D	511	200	YES	10:12	
APARTMENT - LEVEL 03							
40	O	L/K/D	761	200	YES	08:49	YES
41	O	BEDROOM	334	100	NO	03:45	
42	O	BEDROOM	379	100	NO	03:45	
43	P	L/K/D	234	200	NO	04:20	NO
44	P	BEDROOM	339	100	NO	02:39	
45	Q	BEDROOM	390	100	NO	03:45	NO
46	Q	BEDROOM	331	100	NO	03:45	
47	Q	L/K/D	424	200	NO	03:53	
48	R	L/K/D	342	200	YES	03:25	YES
49	R	BEDROOM	395	100	YES	04:27	
50	R	BEDROOM	311	100	YES	04:24	
51	S	BEDROOM	312	100	YES	04:27	YES
52	S	BEDROOM	403	100	YES	04:26	
53	S	L/K/D	653	200	YES	10:30	

Table 03: Assessment Data

Fig. 12: Floor Plan - Level 02

Fig. 11: Floor Plan - Level 03

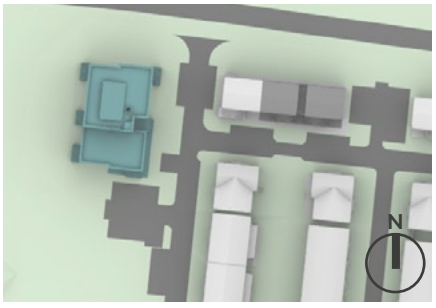


APARTMENT

ROOM REF.	FLAT	ROOM USE	DAYLIGHT		SUNLIGHT		
					BY ROOM		BY DWELLING
			MEDIAN DAYLIGHT ILLUMINANCE (lux)	TARGET (lux)	WINDOW WITHIN 90° DUE SOUTH	21 MAR	WINDOW WITHIN 90° DUE SOUTH
APARTMENT - LEVEL 04							
54	T	L/K/D	348	200	NO	04:20	NO
55	T	BEDROOM	363	100	NO	03:45	
56	U	BEDROOM	403	100	NO	03:45	NO
57	U	BEDROOM	347	100	NO	03:45	
58	U	L/K/D	511	200	NO	04:20	
59	V	L/K/D	415	200	YES	04:57	YES
60	V	BEDROOM	413	100	YES	04:27	
61	V	BEDROOM	321	100	YES	04:27	

Table 04: Assessment Data

Fig. 13: Floor Plan - Level 04



DUPLEX

ROOM REF.	FLAT	ROOM USE	DAYLIGHT		SUNLIGHT		
			MEDIAN DAYLIGHT ILLUMINANCE (lux)	TARGET (lux)	BY ROOM		BY DWELLING
					WINDOW WITHIN 90° DUE SOUTH	21 MAR	WINDOW WITHIN 90° DUE SOUTH
DUPLEX - LEVEL 00							
62	Unit No. 84	BEDROOM	190	100	YES	05:37	YES
63	Unit No. 84	BEDROOM	453	100	YES	05:18	
64	Unit No. 84	L/K/D	278	200	NO	00:00	
65	Unit No. 86	L/K/D	279	200	NO	00:00	YES
66	Unit No. 86	BEDROOM	455	100	YES	05:21	
67	Unit No. 86	BEDROOM	249	100	YES	07:21	
DUPLEX - LEVEL 01							
68	Unit No. 85	L/K/D	660	200	YES	08:38	YES
72	Unit No. 87	L/K/D	642	200	YES	08:58	YES
DUPLEX - LEVEL 02							
69	Unit No. 85	BEDROOM	480	100	YES	08:43	
70	Unit No. 85	BEDROOM	609	100	YES	08:43	
71	Unit No. 85	BEDROOM	680	100	NO	00:00	
73	Unit No. 87	BEDROOM	669	100	NO	00:00	
74	Unit No. 87	BEDROOM	582	100	YES	08:43	
75	Unit No. 87	BEDROOM	480	100	YES	08:43	

Table 05: Assessment Data

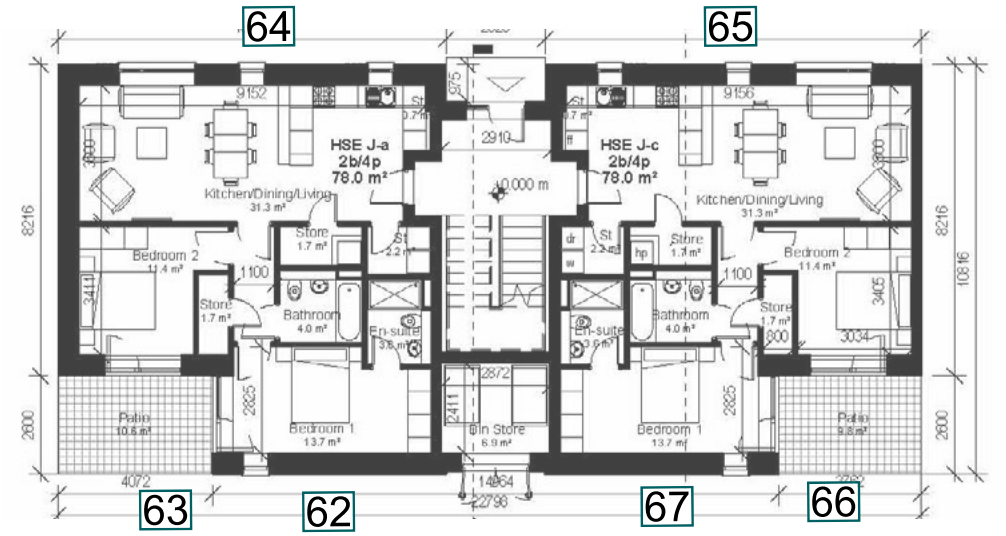


Fig. 14: Floor Plan - Level 00

Fig. 15: Floor Plan - Level 01

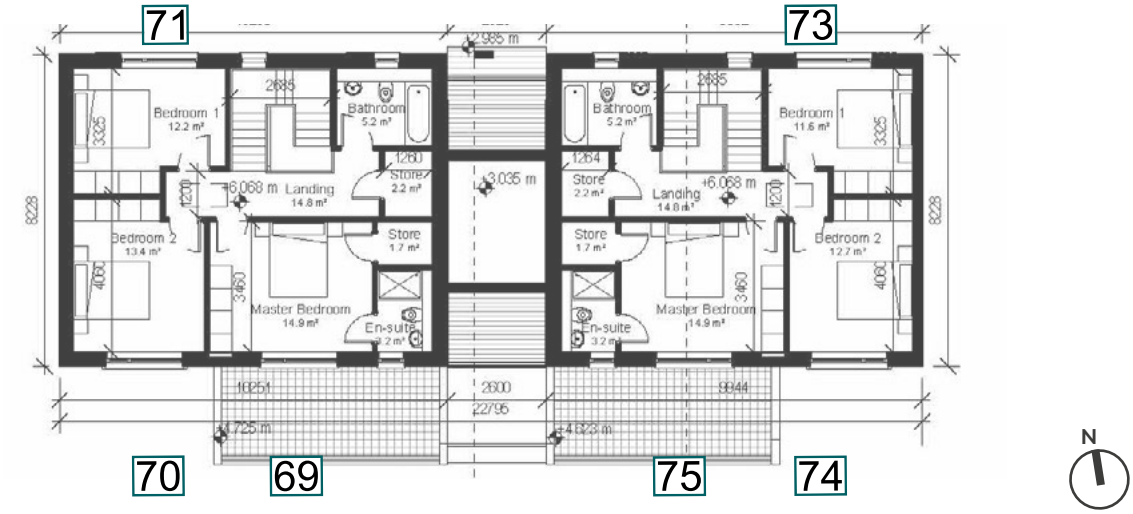
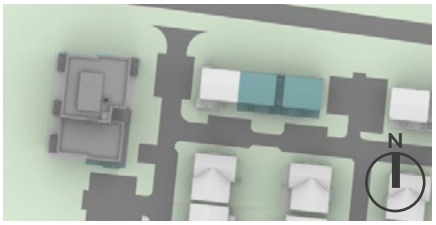


Fig. 16: Floor Plan - Level 02



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