



Client: Albemarle Property

Assessment for the Provision Daylight and Sunlight within the Development at
Conex House, Field End Road, Ruislip, HA5 1RJ

May 2024



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1 Background and Scope of Appraisal

1.1 Study Objectives

Herrington Consulting has been commissioned by Albemarle Property to analyse and quantify the provision of natural daylight and sunlight to the habitable rooms within the proposed development at Conex House, Field End Road, Ruislip, HA5 1RJ.

1.2 Site Location

The site is situated in the area of Pinner in north-west London and is located within administrative boundaries of the London Borough of Hillingdon. The location of the site is shown in Figure 1.1 and the site plan included in Appendix A.1 gives a more detailed reference to the site location and layout.

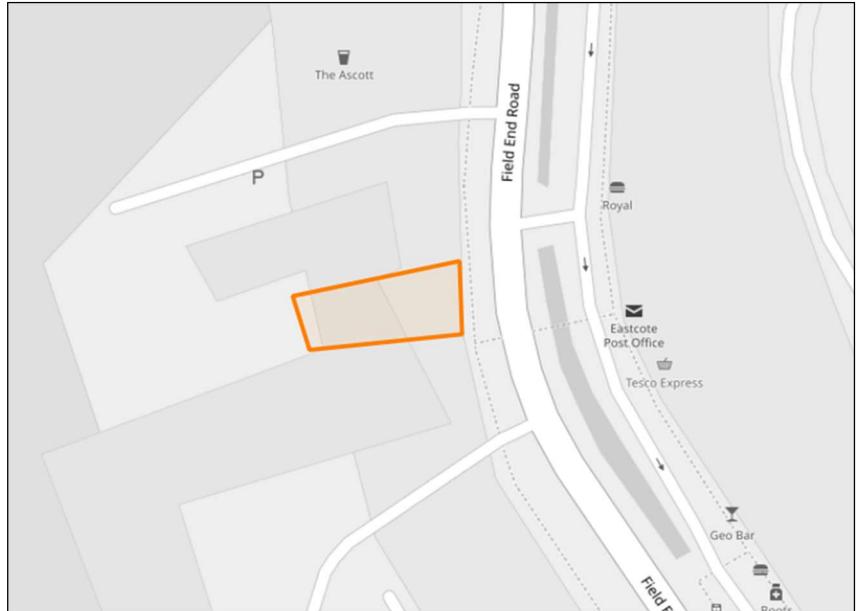


Figure 1.1 – Location map (contains Ordnance Survey data © Crown copyright and database rights 2015)

1.3 The Development

The proposal for development is to convert the existing three-storey building to accommodate five new flats. Drawings of the proposed scheme are included in Appendix A.1.

2 Policy and Guidance

2.1 National Planning Policy

National Planning Policy Framework (December 2023)

Paragraph 129 on 'Achieving appropriate densities' states that "c) local planning authorities should refuse applications which they consider fail to make efficient use of land, taking into account the policies in this Framework. In this context, when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site (as long as the resulting scheme would provide acceptable living standards)."

2.2 Regional Planning Policy

The London Plan – The Spatial Development Strategy for Greater London – (March 2021)

Policy D6 on 'Housing quality and standards' states that "C) Housing development should maximise the provision of dual aspect dwellings and normally avoid the provision of single aspect dwellings. A single aspect dwelling should only be provided where it is considered a more appropriate design solution to meet the requirements of Part B in Policy D3 Optimising site capacity through the design-led approach than a dual aspect dwelling, and it can be demonstrated that it will have adequate passive ventilation, daylight and privacy, and avoid overheating."

The London Plan – Supplementary Planning Guidance – Housing (March 2016)

Policy 7.6Bd on 'Standards for privacy, daylight and sunlight' states that "An appropriate degree of flexibility needs to be applied when using BRE guidelines to assess the daylight and sunlight impacts of new development on surrounding properties, as well as within new developments themselves. Guidelines should be applied sensitively to higher density development, especially in opportunity areas, town centres, large sites and accessible locations, where BRE advice suggests considering the use of alternative targets."

Similarly, Paragraph 2.3.47 on 'Daylight and Sunlight' includes the following statement "Quantitative standards on daylight and sunlight should not be applied rigidly, without carefully considering the location and context and standards experienced in broadly comparable housing typologies in London."

Standard 32 on 'Daylight and Sunlight' states that "All homes should provide for direct sunlight to enter at least one habitable room for part of the day. Living areas and kitchen dining spaces should preferably receive direct sunlight."

2.3 Local Planning Policy

Hillingdon Local Plan (January 2020)

Policy DMHB 17: Residential Density states on Paragraph 5.65 that "A habitable room is defined as a room within a dwelling, the primary use of which is for living, sleeping or dining. This definition includes living rooms, dining rooms, bedrooms, studies and conservatories but excludes halls, corridors, bathrooms and lavatories. For the purpose of this policy, kitchens which provide space for dining

and have windows, will be considered habitable rooms and should be fully considered as part of the assessment of amenity impacts.”

2.4 Best Practice Guidance

In the absence of official national planning guidance/legislation on daylight and sunlight, the most recognised guidance document is published by the Building Research Establishment and entitled 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice', Third Edition, 2022; herein referred to as the '**BRE Guidelines**'.

This version includes significant changes to the 2011 edition methodologies used for analysing daylight and sunlight provision to new developments, and therefore this assessment has been prepared in line with the current 2022, third edition of the guidelines.

The BRE Guidelines are not mandatory and themselves state that they should not be used as an instrument of planning policy, however in practice they are heavily relied upon as they provide a good guide to approach, methodology and evaluation of daylight and sunlight impacts.

In conjunction with the BRE Guidelines, further guidance is given within **BS EN 17037:2018 - Daylight in Buildings**. This British Standard is the UK implementation of the European Standard and supersedes BS 8206 - 2:2008.

Whilst the BRE Guidelines provide numerical guidance for daylight, sunlight and overshadowing, these criteria should not be seen as absolute targets. The document states that the intention of the guide is to aid rather than constrain the

designer. The Guide is not an instrument of planning policy, therefore whilst the methods given are technically robust, it is acknowledged that some level of flexibility should be applied where appropriate.

3 Assessment Techniques

3.1 Background

Natural light refers to both daylight and sunlight. However, a distinction between these two concepts is required for the purpose of analysis and quantification of natural light in buildings. In this assessment, the term '*Daylight*' is used for natural light where the source is the sky in overcast conditions, whilst '*Sunlight*' refers specifically to the light coming directly from the sun.

The updated third edition of the BRE Guidelines no longer supports the use of the Average Daylight Factor (ADF) method of calculating illuminance within a room, and now recommends two alternative methodologies. These are based on the assessment methods included within the BS EN 17037, but with the adaptions as set out in the UK National Annex. The two methods are described as follows.

3.2 Illuminance

The Illuminance method involves using climatic data based on the location of the site to calculate the illuminance of the specified reference plane resulting from natural daylight entering the room via windows and other glazed apertures. The analysis is carried out across an assessment grid on the reference plane for at least hourly intervals for a typical year. The objective of this test is to achieve a target illuminance (E_T), which varies depending on room use, across at least half of the reference plane. This level of illuminance needs to be achieved for at least half of the daylight hours.

For UK dwellings, there are specific recommendations for daylight provision, and these are set out in the UK National Annex. These minimum recommendations for habitable rooms acknowledge the specific challenges faced in the UK and these are used throughout this appraisal. The minimum illuminance recommendations are:

- 100 lux in bedrooms
- 150 lux in living rooms
- 200 lux in kitchens/studios

These are the median illuminances to be exceeded over at least 50% of the assessment points in the room for at least half of the daylight hours. The National Annex also states that the recommended levels over 95% of a reference plane need not apply to dwellings in the UK.

3.3 Daylight Factor

In the same way as for the Illuminance method, this method calculates the Daylight Factor (DF) at each calculation point on an assessment grid within each room. DF 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 expressed as a percentage.

Given that the numerical modelling process uses an overcast sky model, the orientation of the window(s) serving the room has no bearing on the daylight availability. However, in order to account for different climatic conditions at different locations around the UK, the National Annex provides daylight factor

targets (D_T) corresponding to the target illuminances for locations of differing latitude. These are shown in Table 3.1 and for each assessment, the targets associated with the location with the closest latitude are adopted.

Location	DT for 100 lx (Bedroom)	DT for 150 lx (Living room)	DT for 200 lx (Kitchen)
St Peter (Jersey)	0.6%	0.9%	1.2%
London (Gatwick Airport)	0.7%	1.1%	1.4%
Birmingham	0.6%	0.9%	1.2%
Hemsby (Norfolk)	0.6%	0.9%	1.3%
Finningley (Yorkshire)	0.7%	1.0%	1.3%
Aughton (Lancashire)	0.7%	1.1%	1.4%
Belfast	0.7%	1.0%	1.4%
Leuchars (Fife)	0.7%	1.1%	1.4%
Oban	0.8%	1.1%	1.5%
Aberdeen	0.7%	1.1%	1.4%

Table 3.1 – Minimum Target Daylight Factors (D_T)

The recommendations are met if the daylight factors calculated in a room meets or exceeds the specific minimum target for room type and location.

3.4 Sunlight Exposure

The provision of sunlight within new development is also important, especially within the main living areas. Bedrooms and kitchens are generally viewed as less important, where occupants normally prefer sunlight in the mornings.

The requirements for access to sunlight are set out within BS EN 17037 and this standard is adopted by the BRE Guidelines, which recommends that a space

should receive a minimum of 1.5 hours of direct sunlight on the spring equinox (21st March) with cloudless conditions. The medium level of recommendation is three hours and the high level of recommendation four hours. The number of sunlight hours received by each window is calculated using specialist software described in Section 4.2.

The Guidelines state that at least one habitable room, preferably a main living room, should meet at least the minimum criterion.

For new development, and especially where existing buildings are being re-developed, it is important to acknowledge that these are aspirational targets intended to aid and not constrain the designer.

3.5 Sunlight to Amenity Areas

The BRE Guidance suggests that where new development is served by amenity areas, then analysis can be undertaken to quantify the amount of sunlight these amenity areas will enjoy. Typical examples of areas that could be considered as open spaces or amenity areas are main back gardens of houses, allotments, parks and playing fields, children's playgrounds, outdoor swimming pools, sitting-out areas, such as in public squares and focal points for views, such as a group of monuments or fountains.

Sun Hours on Ground

The BRE Guidelines recommend that for a garden or amenity area to appear adequately sunlit throughout the year, at least 50% of an amenity area should receive at least 2 hours of sunlight on 21st March.

When undertaking this analysis, sunlight from an altitude of 10° or less has been ignored as this is likely to be obscured by planting and undulations in the surrounding topography. Driveways and hard standing for cars is also usually left out of the area used for this calculation. Fences or walls less than 1.5 metres high are also ignored. Front gardens which are relatively small and visible from public footpaths are omitted with only main back gardens needing to be analysed.

The Guidelines also state that *“normally, trees and shrubs need not be included, partly because their shapes are almost impossible to predict, and partly because the dappled shade of a tree is more pleasant than a deep shadow of a building.”* This is especially the case for deciduous trees, which provide welcome shade in the summer whilst allowing sunlight to penetrate during the winter months.

4 Assessment Methodology

4.1 Method of Baseline Data Collation

The following data has been used to inform this study:

- OS Mastermap mapping
- Measured survey data (Survey and Engineering Services Ltd – July 2023)
- Scheme drawings in AutoCAD format (Urban Infill – May 2024)
- 3D Building model constructed using photogrammetric techniques (provided by Accucities, Oct 2023 based on satellite imagery from 2022 to 15cm accuracy)
- Aerial photography (Google Maps and Bing)

4.2 Numerical Modelling

The numerical analysis used in this assessment has been undertaken using the Waldrum Tools (Version 6.0.0.16) software package.

4.3 Calculation Assumptions

The following assumptions have been made when undertaking the analysis:

- When assessing the Illuminance and/or Daylight Factor for internal rooms and in the absence of specific information, the following parameters are assumed:
 - The glazing type is assumed to be double glazing (Pilkington K Glass 4/16/4 Argon filled) with a light transmittance value of 0.78 (value for double glazed unit not per pane).
 - Correction factor for frames and glazing bars = 0.8
 - Where information from the designer is not available, the following values are used to derive the Maintenance Factor applied to the transmittance values.

Type of window	Maintenance Factor	
	Rural/suburban	Urban
Vertical, no overhang	0.96	0.92
Vertical, sheltered from rain by balcony/overhang	0.88	0.76
Sloping rooflight	0.92	0.84
Horizontal rooflight	0.88	0.76

Table 4.1 – Parameters used for deriving Maintenance Factor

- The reflectance values used in the numerical analysis are shown in Table 4.2.

Surface	Material/Finish	Value
Internal walls	White walls	0.8
Internal ceiling	White ceilings	0.8
Internal flooring	Light wooden floors / cream carpet	0.4
Exterior walls and obstructions	<i>Standard value applied</i>	0.2
Exterior ground	<i>Standard value applied</i>	0.2

Table 4.2 – Reflectance Values

- The calculation of illuminance or daylight factor is carried out on a grid of points on a reference plane within each assessed room. The plane is set 0.85m from the floor level. This assessment grid excludes a band of 0.3m from the walls, unless otherwise specified.
- BS EN 17037 gives an equation for maximum grid spacing. However, in line with the recommendation of the BRE Guidelines for domestic rooms, a maximum grid spacing of 0.3m is adopted.

4.4 Location Specific Data

In terms of latitude, the subject site is located in closest proximity to London (Gatwick Airport), and therefore climatic conditions and DF targets are set using values for this latitude.

5 Daylight Provision

5.1 Principles of Analysis

As discussed in Section 3, there are two tests for daylight; Illuminance and Daylight Factor. The Illuminance test has been applied to the habitable rooms within the development in the first instance, and the results are discussed in Section 5.2. In circumstances where the Illuminance test is not compliant, the Daylight Factor analysis has also been calculated. The detailed numerical outputs are included in Appendix A.3.

When setting the target illuminance value (E_T), it is important to account for rooms that have a shared use, as it is necessary to apply the highest target. For example, in a bedroom/sitting room in a studio apartment, the value for a living room should be used as the occupants would be spending the majority of the daylight hours using the space as a living room.

However, in the case of a living/dining/kitchen area, the BRE Guidelines fully acknowledge that in the majority of situations, the kitchen element of these open plan living areas is not treated as a habitable space. Therefore, it is acceptable to adopt the target for the dominant room use, i.e. a living room. It is, nevertheless, still necessary to include the kitchen space as part of the assessment area, albeit that the interpretation of the daylighting results reflects the non-habitable status of the kitchen area.

In addition, if a kitchen is less than 13m², then it is conventional for this room to be considered as a non-habitable space. In which case, such rooms are not necessarily included within the reported outputs of the model.

It is also conventional to assume that where the layout of the rooms and fenestration on lower floors is repeated on the floors above, then providing the daylighting provision on the lower floors meets the specific requirements, it can be inferred that the rooms on the floors above will also meet the target criteria.

5.2 Illuminance Analysis

Using the analytical techniques and assumptions discussed in Sections 3 and 4 respectively, the illuminance within each habitable room has been calculated.

For each room, the percentage of the assessment area that meets or exceeds the target illuminance value (E_T) is presented in the detailed outputs included in Appendix A.3. To meet the assessment criteria, 50% or more of the assessment area will need to achieve illuminance that meets or exceeds E_T . The results are summarised below.

Property	No. Rooms Tested	Rooms satisfying BRE Criteria		Rooms not satisfying BRE Criteria
		No.	%	
Flat 1	3	3	100%	0
Flat 2	2	2	100%	0
Flat 3	2	2	100%	0
Flat 4	2	2	100%	0
Flat 5	2	2	100%	0
Total	11	11	100%	0

Table 5.1 – Results of the Illuminance analysis

From the results in Table 5.1, it can be seen that all habitable rooms within the proposed development meet or exceed the target illuminance value (E_T).

5.3 Summary of Daylight Provision

As the rooms are fully compliant with the Illuminance test, it has not been necessary to carry out the Daylight Factor test in this instance. This is because the UK National Annex to BS EN 17037 states that the provision of natural daylight be adequate provided that at least one of the two daylight tests are passed.

Consequently, it can be concluded that these habitable spaces will be **well lit** and will have a reduced reliance on supplementary electric lighting.

6 Sunlight Provision

6.1 Sunlight Exposure Analysis

The BRE document provides guidance in respect of sunlight quality for new developments, stating in Paragraph 3.1.2 that *“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.”*

When considering the provision and access to sunlight, the quantitative methods set out within BS EN 17037 are used and based on these, the BRE Guidelines recommend that a space, preferably a main living room, should receive a minimum of 1.5 hours of direct sunlight under cloudless conditions on the 21st March (spring equinox).

The BS EN 17037 criterion applies to rooms of all orientations, although it is recognised that if a room faces significantly north of due east or west it is unlikely to be met.

It should be noted that where rooms have more than one window, it is acceptable to sum the non-coincident sunlight hours to achieve a ‘room total’. This approach is acknowledged by the BRE Guidelines and facilitates a greater understanding of the sunlight received within a room by taking into account the fact that some windows will receive sunlight at different times during the day.

The detailed outputs from the Sunlight Exposure analysis are presented in Appendix A.3 and the results are summarised below.

Property	Room Reference	Room Use	SE Hours	SE Rating	Meets BRE Criteria?
Flat 1	R1	LKD	2.9	Minimum North-facing North-facing	Yes
	R2	Bedroom	1.1		
	R3	Bedroom	1.4		
Flat 2	R1	LD	5.1	High Minimum	Yes
	R2	Bedroom	1.6		
Flat 3	R1	LKD	2.9	Minimum Minimum	Yes
	R2	Bedroom	2.9		
Flat 4	R1	LKD	4.8	High Minimum	Yes
	R2	Bedroom	2.7		
Flat 5	R1	LKD	2.7	Minimum Minimum	Yes
	R2	Bedroom	2.9		

Table 6.1 – Results of the Sunlight Exposure analysis

The BRE requirements for sunlight are that at least one main window faces within 90 degrees of due south and that a habitable room, preferably a main living room, should receive a total of at least 1.5 hours of sunlight on 21st March.

From the results in Table 6.1, it can be seen that all units have at least one habitable room that meet or exceed the minimum requirements set out within the BRE Guidelines. In all cases, this includes the main living space. When taking into consideration the provision of direct sunlight to the development as a whole, the overall level is considered to be **adequate**.

7 Conclusions

The detailed analysis undertaken as part of this assessment has examined the provision of natural daylight and sunlight to the habitable rooms within the proposed development at Conex House, Field End Road, Ruislip, HA5 1RJ. Using detailed numerical modelling applications, the Illuminance and Sunlight Exposure have been quantified for each room. In line with the assessment criteria prescribed by the BRE Guidelines, it has been shown that for all habitable rooms, the provision of natural daylight will meet or exceed the minimum required threshold set out in the BRE Guidelines. Consequently, it can be concluded that these habitable spaces will be **well lit** and will have a reduced reliance on supplementary electric lighting.

It has also been possible to demonstrate that in each of the proposed units, the main living area will receive at least 1.5 hours of direct sunlight. As a consequence of the light and additional visual interest provided by sunlight, the amenity value of these rooms will be enhanced.

A Appendices

Appendix A.1 – Scheme Drawings

Appendix A.2 – Graphical Model Outputs

Appendix A.3 – Tabulated Results for Daylight & Sunlight Calculations

Appendix A.1 – Scheme Drawings

OS gridlines

OS datums

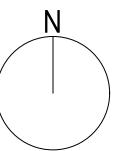
5.2m

CONVEYANCING

Site boundary



Existing: Site Location Plan



Adjoining properties / / / / Assumed/ hidden / / /

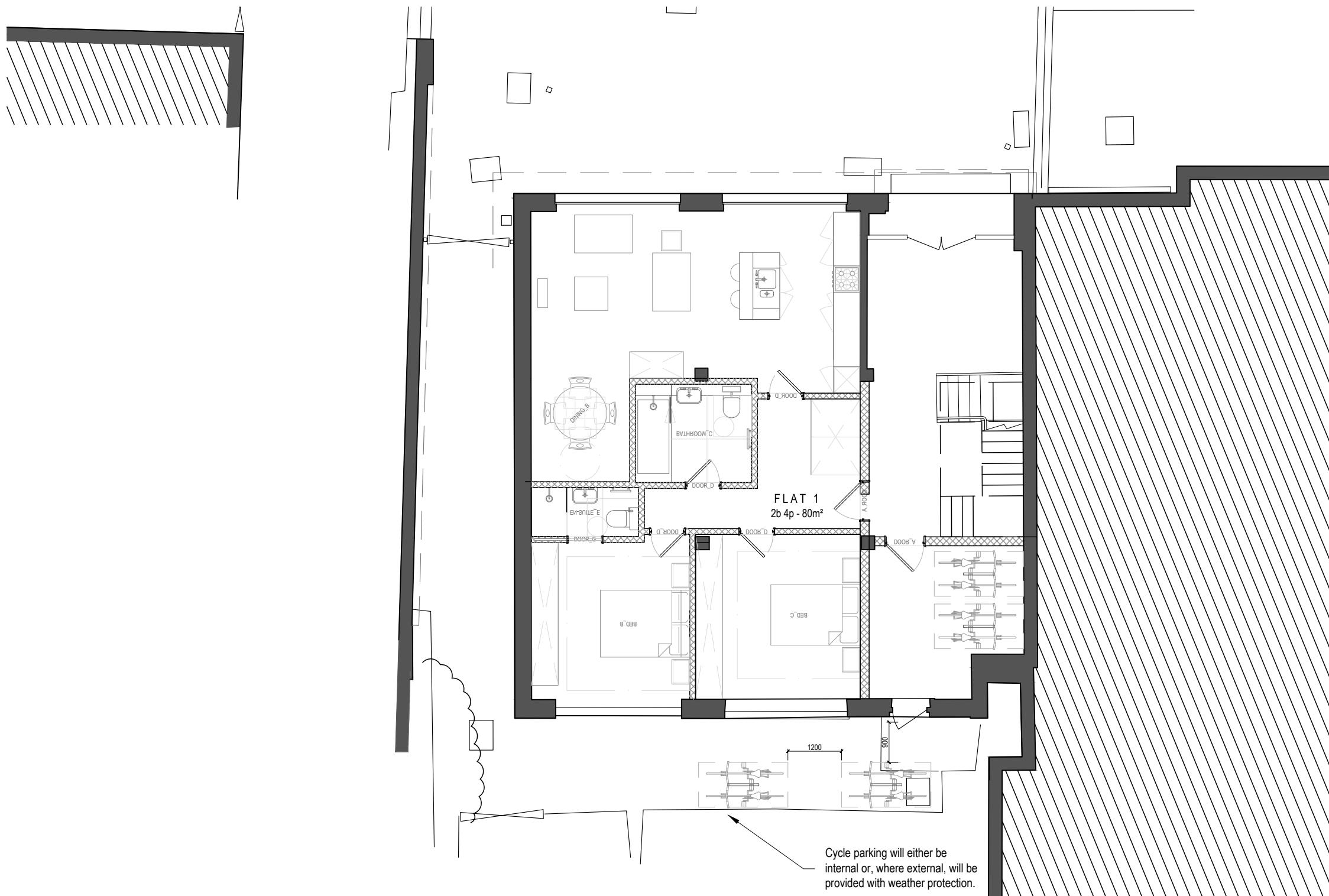
Proposed structure

EXISTING LEGEND

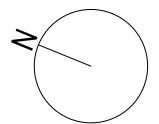
— — Hidden

— Internal features

— External features



Proposed: Ground Floor Plan



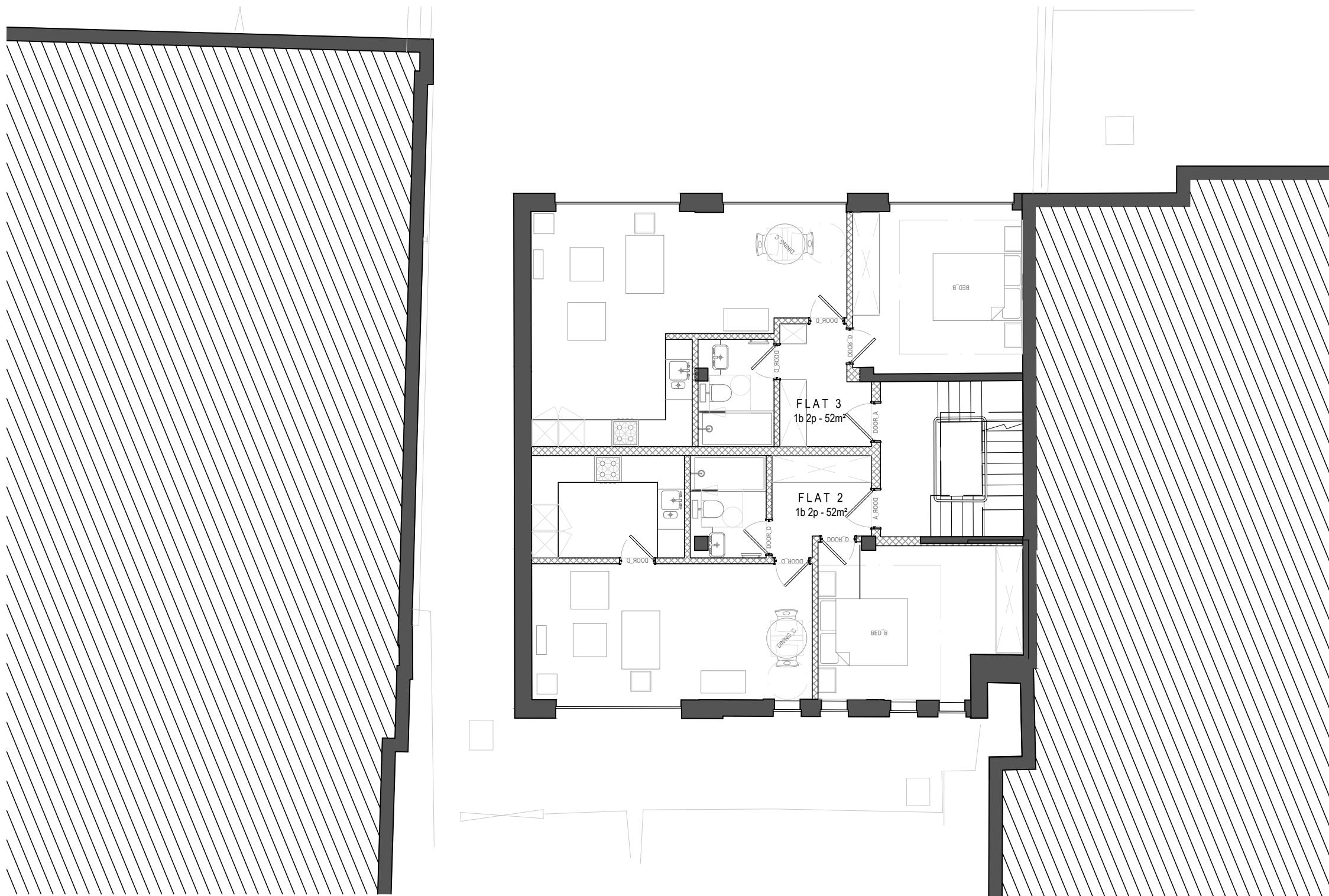
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Proposed structure

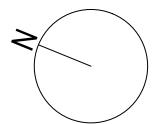
EXISTING LEGEND

— — Hidden

— — Internal features — — External features



Proposed: First Floor Plan



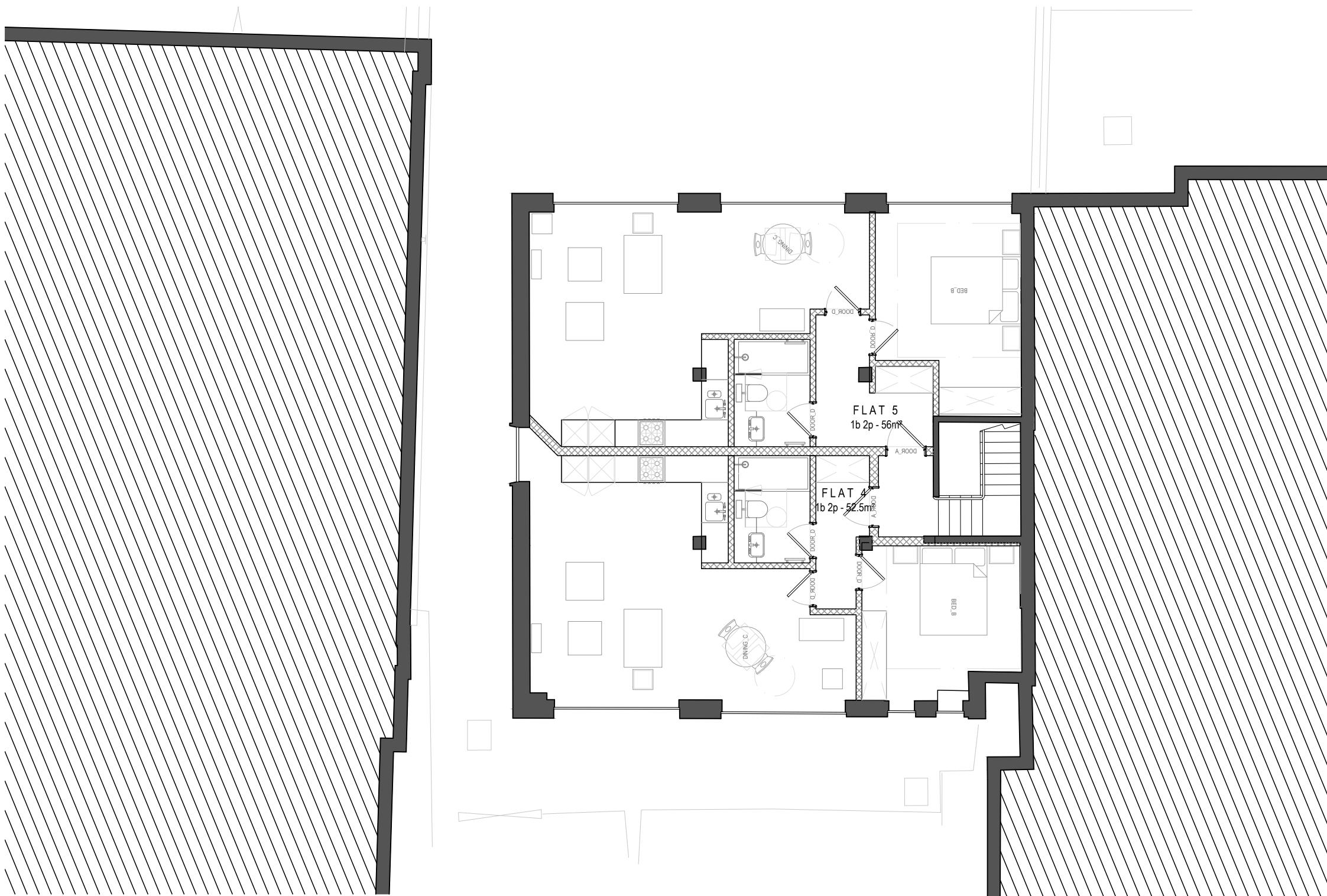
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Proposed structure

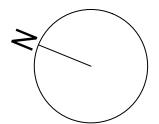
EXISTING LEGEND

— — Hidden

— — Internal features — — External features



Proposed: Second Floor Plan



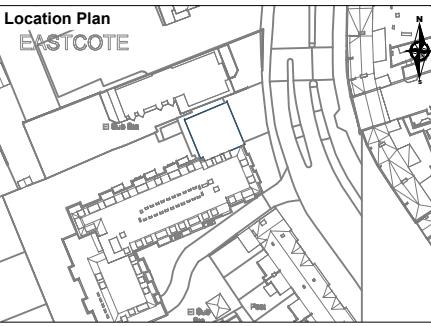
Appendix A.2 – Graphical Model Outputs



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Legend

- Proposed Buildings
- Surrounding Buildings

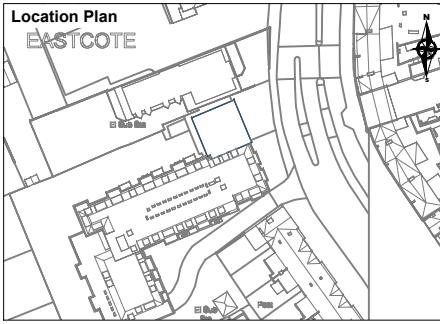
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Field End Road, Ruislip			
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DWG REF.			
3D Model - Proposed Location Plan			DWG No. 3868_01



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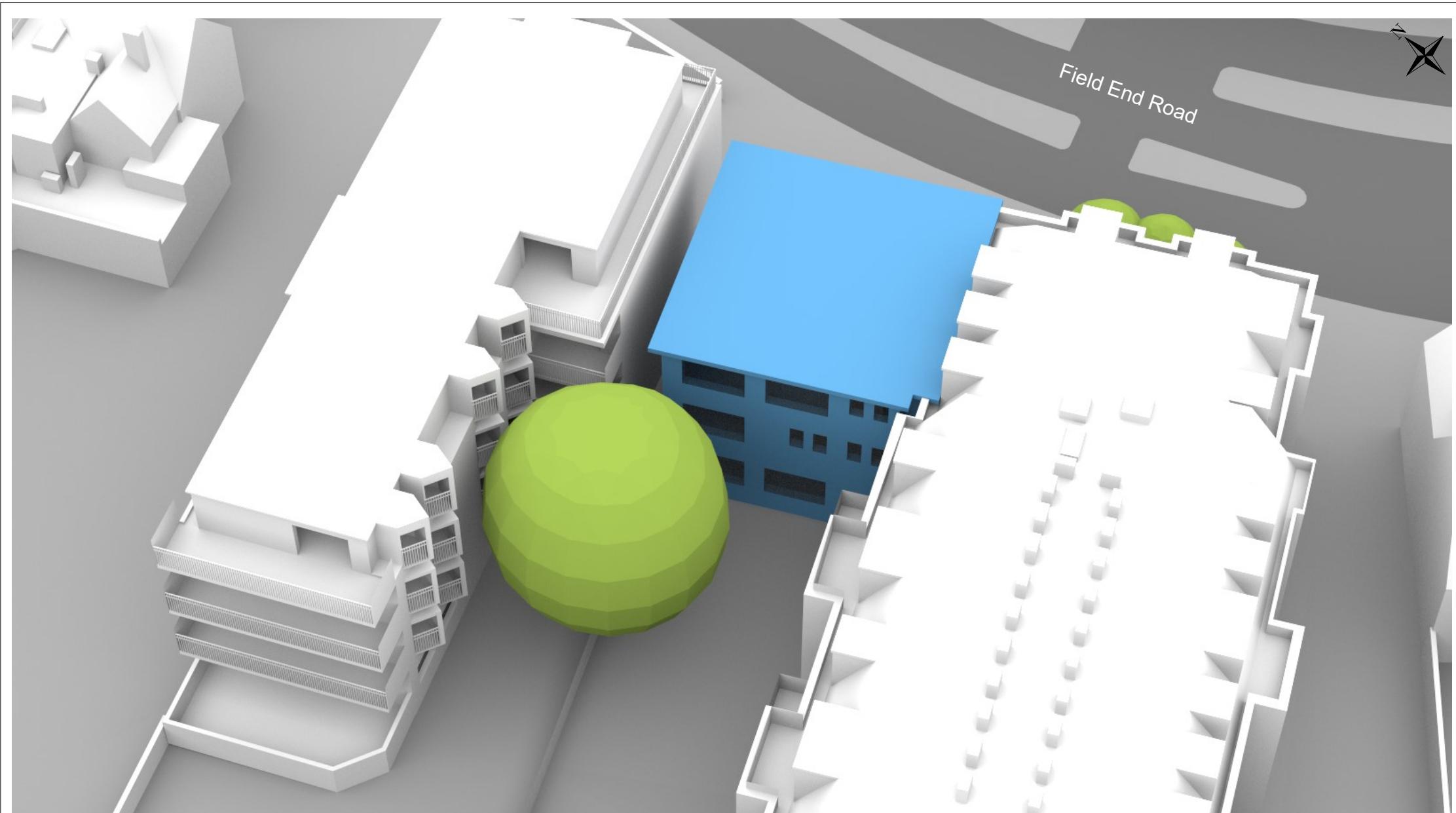
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Legend

- Proposed Buildings
- Surrounding Buildings

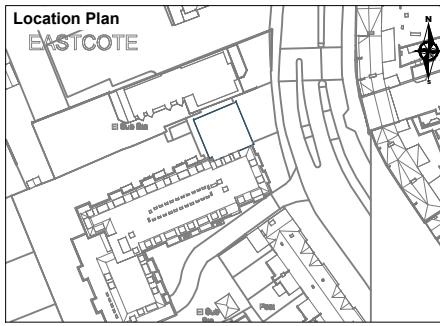
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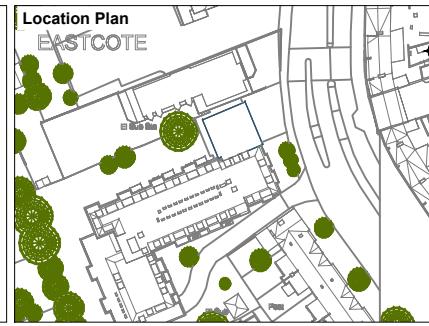
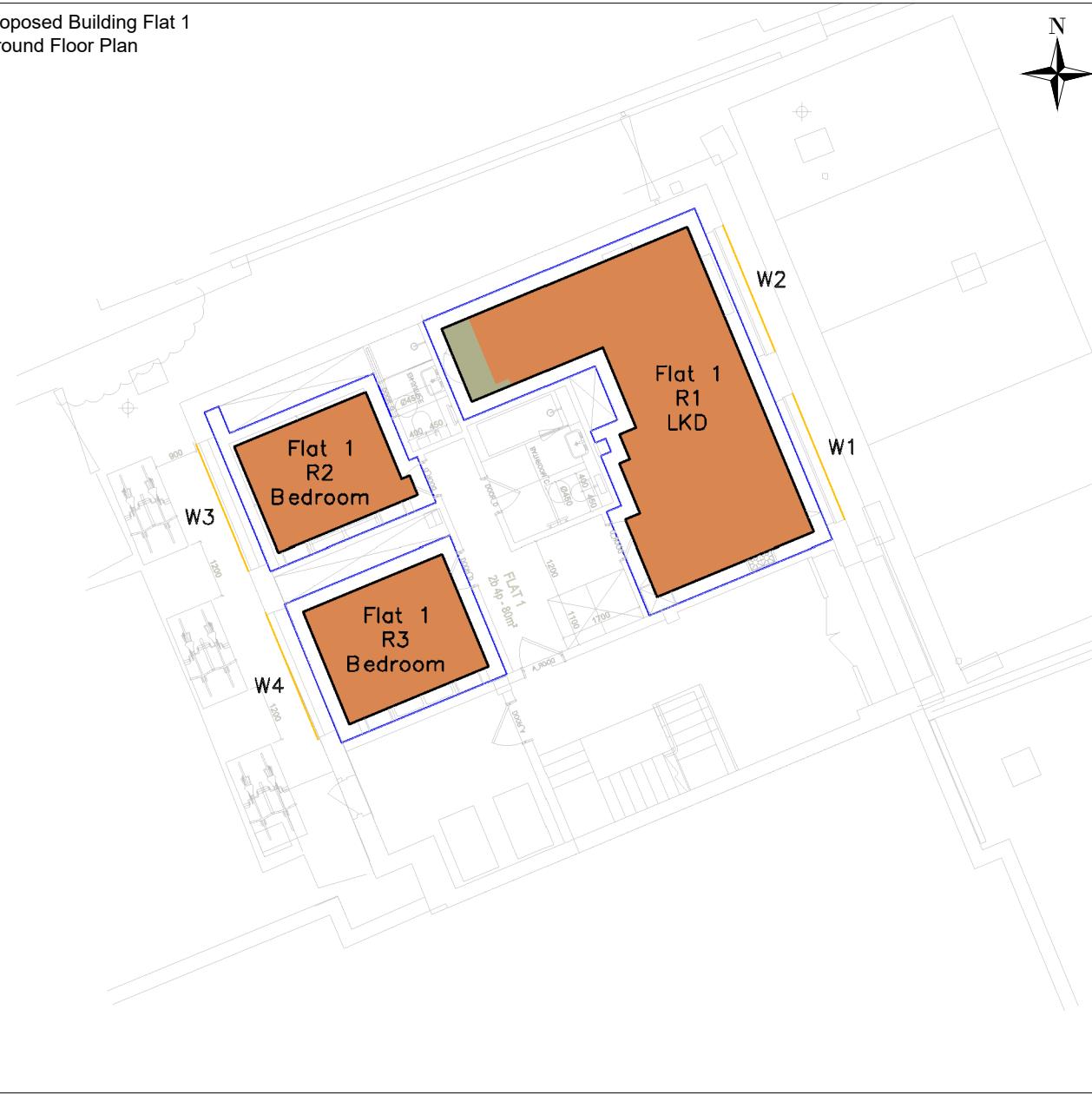
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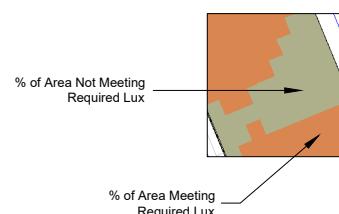
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- Proposed Buildings
- Surrounding Buildings

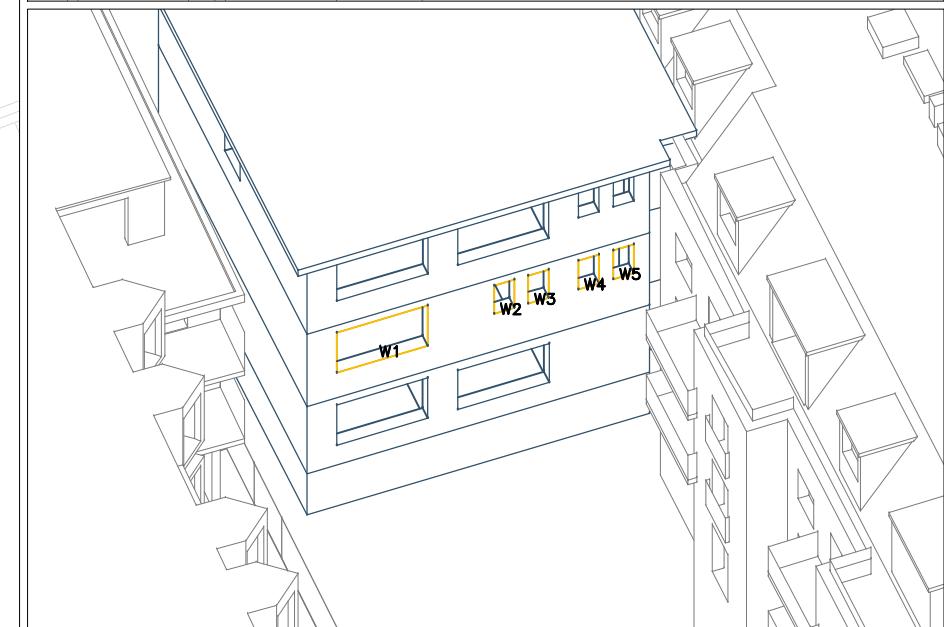
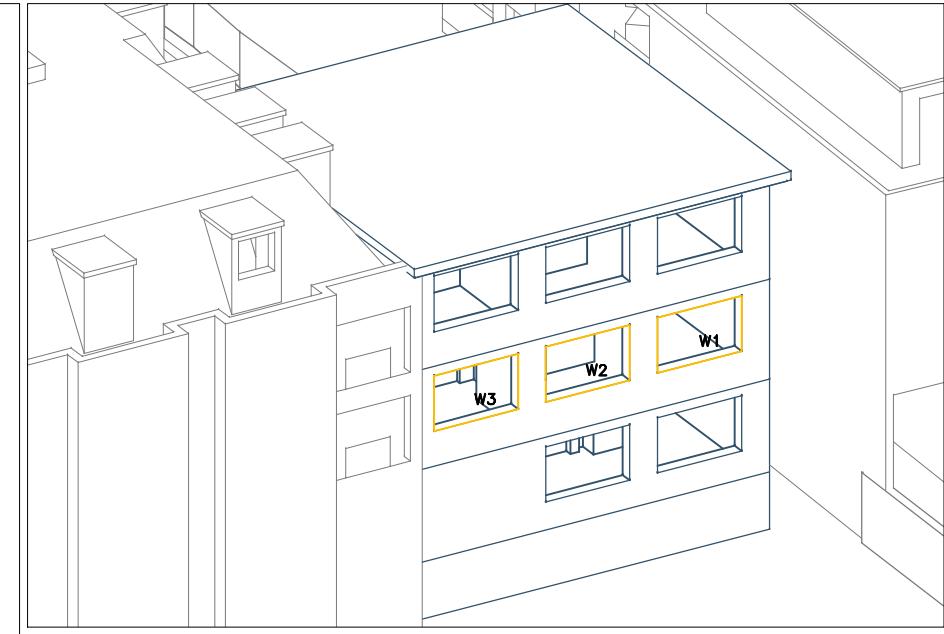
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Legend



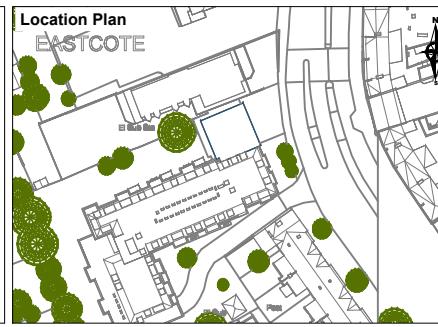
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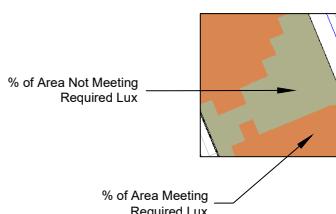
herrington
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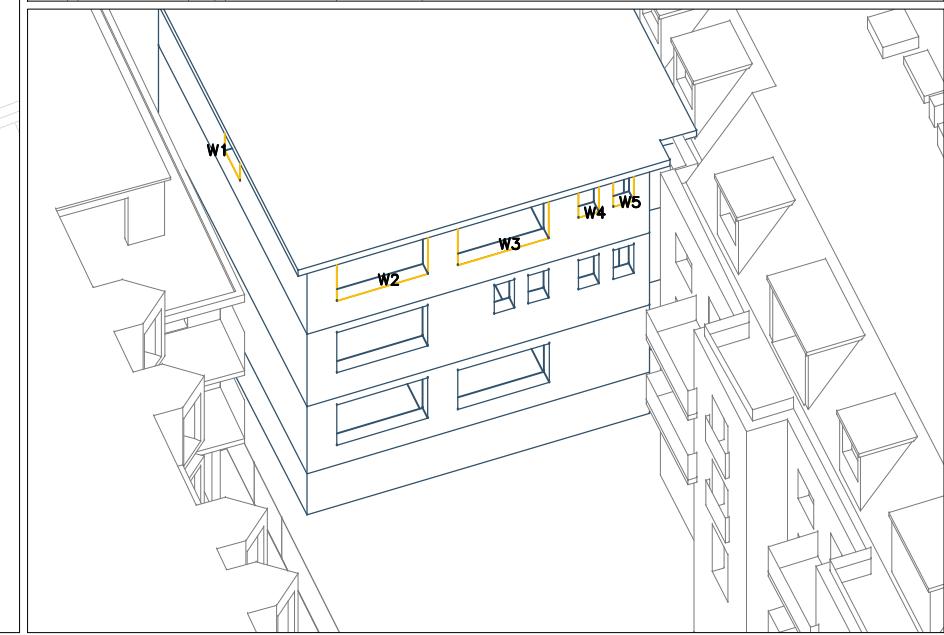
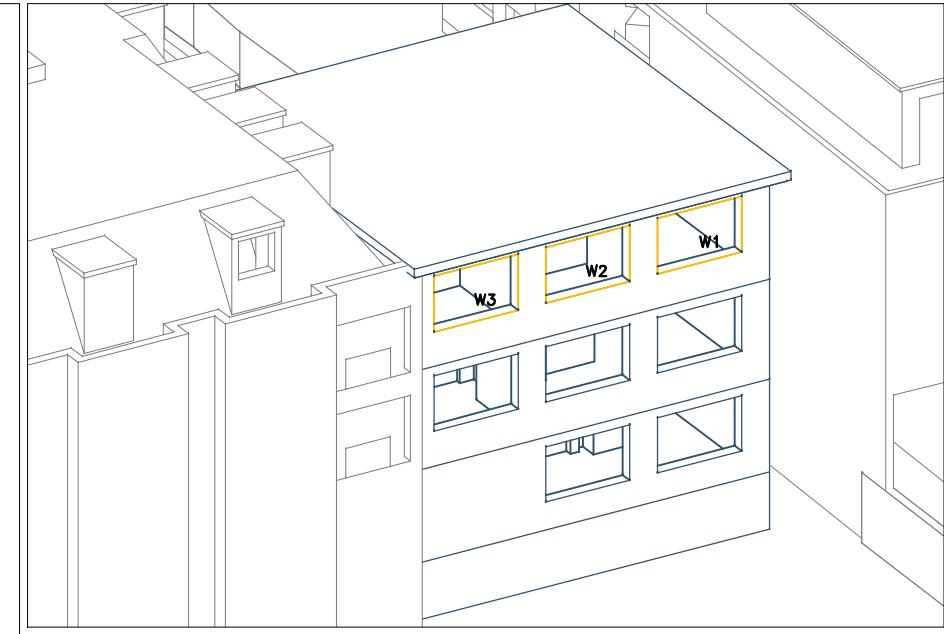
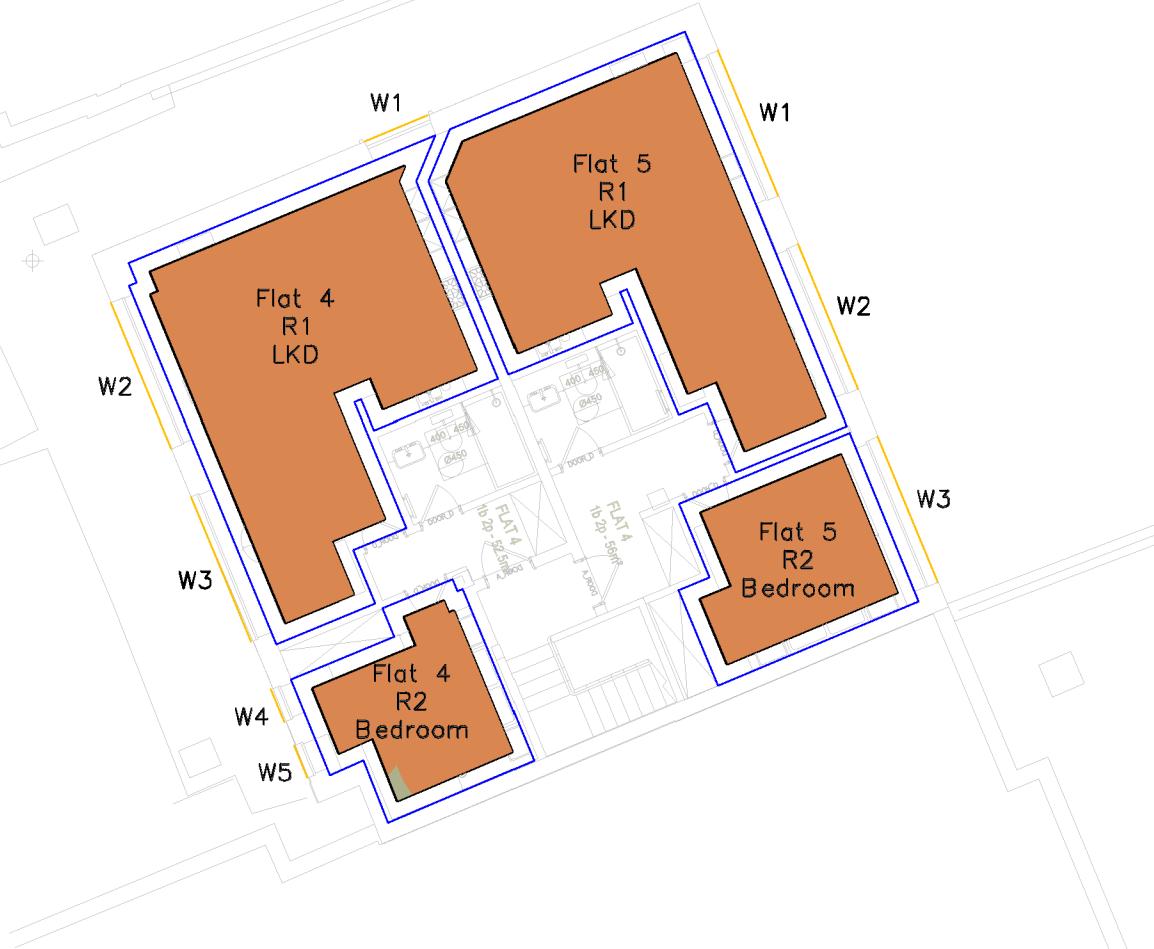
Specialists in the built environment - Coastal, Flood Risk, Drainage, Light Analysis



Legend



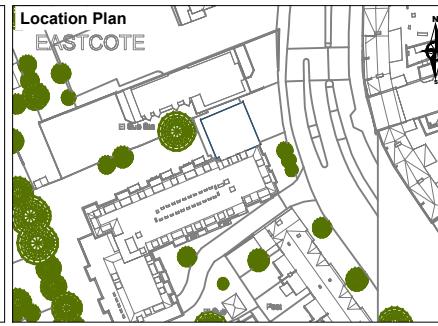
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00	First issue	_____	Date
Rev	Description	_____	_____
CLIENT			
Albemarle Property			
PROJECT			
Field End Road, Ruislip			
SCALE	PROJ REF	ANALYST	DRAWN BY
Not to scale	3868	NAV	LR
DWG REF.			
SDA contours			
DWG No.			
3868_05			



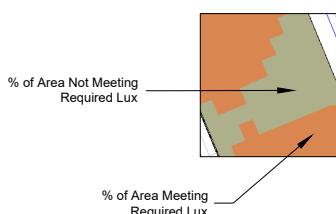
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Specialists in the built environment - Coastal, Flood Risk, Drainage, Light Analysis



Legend



01	Second issue	_____	08/05/2024
00	First issue	_____	Date
Rev	Description	_____	_____
CLIENT			
Albemarle Property			
PROJECT			
Field End Road, Ruislip			
SCALE	PROJ REF	ANALYST	DRAWN BY
Not to scale	3868	NAV	LR
DWG REF.			
SDA contours			
DWG No.			
3868_06			

Appendix A.3 – Tabulated Results for Daylight & Sunlight Calculations

Project Name: Conex House, Field End Road

Project No.: 3868

Report Title: SDA BS En17037 Analysis - Proposed Scheme

Date of Analysis: 07/05/2024

Floor Ref	Room Ref	Property Type	Room Use	Room Area m2	Effective Area	Median Lux	Area Meeting Req Lux	% of Area Meeting Req Lux	Criteria				
									Req Lux	Req % of Effective Area	Req % of Daylight Hours	Daylight Hours	Meets Criteria
Flat 1													
Ground	R1	Residential	LKD	32.65	24.34	657	23.38	96%	200	50%	50%	4380	YES
	R2	Residential	Bedroom	10.71	6.90	188	6.90	100%	100	50%	50%	4380	YES
	R3	Residential	Bedroom	11.36	7.66	312	7.66	100%	100	50%	50%	4380	YES
Flat 2													
First	R1	Residential	LD	19.02	13.80	218	11.02	80%	150	50%	50%	4380	YES
	R2	Residential	Bedroom	13.20	8.99	172	8.99	100%	100	50%	50%	4380	YES
Flat 3													
First	R1	Residential	LKD	27.78	20.75	906	20.75	100%	200	50%	50%	4380	YES
	R2	Residential	Bedroom	12.36	8.25	842	8.25	100%	100	50%	50%	4380	YES
Flat 4													
Second	R1	Residential	LKD	31.68	23.85	609	23.85	100%	200	50%	50%	4380	YES
	R2	Residential	Bedroom	10.46	6.59	215	6.47	98%	100	50%	50%	4380	YES
Flat 5													
Second	R1	Residential	LKD	30.83	23.23	883	23.23	100%	200	50%	50%	4380	YES
	R2	Residential	Bedroom	11.84	7.91	931	7.91	100%	100	50%	50%	4380	YES

Project Name: Conex House, Field End Road

Project No.: 3868

Report Title: Sunlight Exposure Analysis - Proposed Scheme

Date: 07/05/2024

Floor Ref	Room Ref	Property Type	Room Use	Window Ref	Window Orientation	Proposed Sunlight Exposure	Rating	Unit meets BRE criteria
Flat 1								
Ground	R1	Residential	LKD	W1	68°N	2.9		YES
					68°N	2.9	2.9	
	R2	Residential	Bedroom	W3	247°	1.1	1.1	
							Failed	
Ground	R3	Residential	Bedroom	W4	247°	1.4	1.4	Failed
Flat 2								
First	R1	Residential	LD	W1	247°	3.1		YES
					247°	2.9	5.1	
	R2	Residential	Bedroom	W3	247°	1.6		
				W4	247°	0.9		
				W5	247°	0		
							1.6	Minimum

Project Name: Conex House, Field End Road

Project No.: 3868

Report Title: Sunlight Exposure Analysis - Proposed Scheme

Date: 07/05/2024

Floor Ref	Room Ref	Property Type	Room Use	Window Ref	Window Orientation	Proposed Sunlight Exposure	Rating	Unit meets BRE criteria
Flat 3								
First	R1	Residential	LKD	W1	68°N	2.9		YES
					68°N	2.9	2.9	
							Minimum	
First	R2	Residential	Bedroom	W3	68°N	2.9		YES
						2.9	2.9	
							Minimum	
Flat 4								
Second	R1	Residential	LKD	W1	337°N	0		YES
					247°	3.2	4.8	
					247°	4.8	High	
Second	R2	Residential	Bedroom	W4	247°	2.7		YES
					247°	1.8	2.7	
							Minimum	
Flat 5								
Second	R1	Residential	LKD	W1	68°N	2.7		YES
					68°N	2.7	2.7	
							Minimum	
Second	R2	Residential	Bedroom	W3	68°N	2.9		YES
						2.9	2.9	
							Minimum	