



Client: Grays Thurrock Properties Ltd

Assessment for the Provision Daylight and Sunlight within the Development at
Warren Hastings Court, Clifton Marine Parade, Gravesend DA11 9NB

October 2021

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1 Background and Scope of Appraisal

1.1 Study Objectives

Herrington Consulting has been commissioned by Grays Thurrock Properties Ltd to analyse and quantify the provision of natural daylight and sunlight to the habitable rooms within the proposed development at Warren Hastings Court, Clifton Marine Parade, Gravesend DA11 9NB.

1.2 Site Location

The site is situated in the town of Gravesend in Kent and is located within the administrative boundaries of Gravesham Borough Council. The location of the site is shown in Figure 1.1 and the site plan included in Appendix A.1 of this report gives a more detailed reference to the site location and layout.

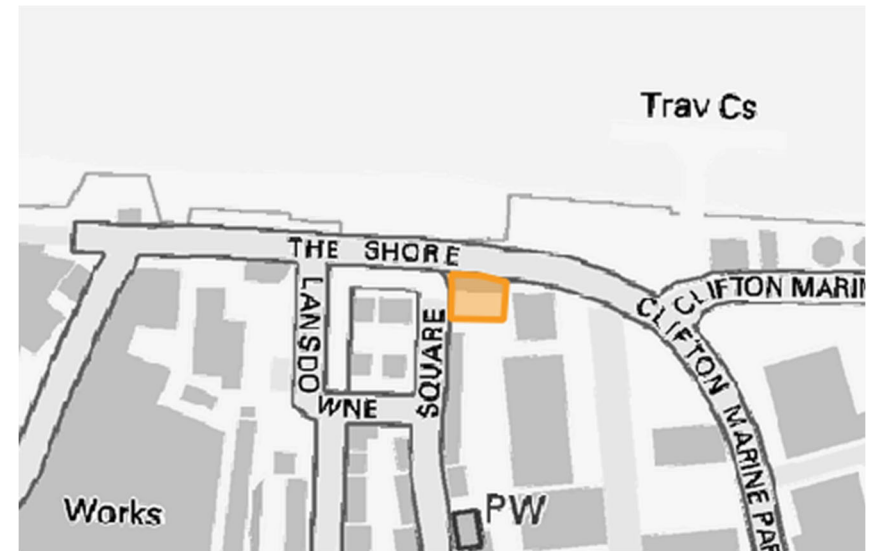


Figure 1.1 – Location map (Contains Ordnance Survey data © Crown copyright and database right 2011)

1.3 The Development

The proposal for development is the conversion of ground floor commercial units into four residential flats (3 x 1-bedroom and 1 x 2 bedroom). Drawings of the proposed scheme are included in Appendix A.1 of this report.

2 Policy and Guidance

2.1 National Planning Policy

National Planning Policy Framework (Revised July 2021)

Paragraph 125 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

Kent Design Guide (2005)

In Section 2 – Creating the Design, Step 2 – Generating the Layout; Section 2.2.8 MAXIMISING THE USE OF SUNLIGHT AND DAYLIGHT it states that: 'Sunlight and energy efficiency should be considered as an integral part of finalising a layout. Sunlight and energy efficiency can be maximised if the layout of new buildings is designed with the following principles in mind; • take advantage of south facing slopes • avoid overshadowing.

Passive Solar Design Passive solar design takes advantage of natural light and heat from the sun and uses air movement for ventilation. This reduces or negates the need for artificial lighting, heating, cooling or ventilation. It can be achieved

with no additional cost to a development and can result in considerable cost savings. High levels of insulation complement this design approach.

In residential development the form of housing can have a significant impact on energy efficiency. Detached houses, particularly single-storey, tend to be less energy efficient, having the greatest surface area exposed to the elements. Assuming the same floor area and orientation, terraced development provides cross-insulation at a lower density, while flats retain heat better.

Layouts should maximise east-west building alignments and orientate most of the glazing to within 30 degrees of due south. Buildings should also be designed to avoid overshadowing and minimise shading from obstructions to sunlight (such as other dwellings and coniferous trees).

2.3 Local Planning Policy

There is no specific reference to the provision of daylight and sunlight to proposed residential developments in the local planning policy of Gravesham Borough Council.

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', Second Edition, 2011; herein referred to as the 'BRE 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 the British Standard (BS) 8206-2:2008: 'Lighting for buildings - Part 2: Code of practice for daylighting'.

In this assessment, the BRE Guidelines have been used to establish the extent to which the Proposed Development meets current best practice guidelines. In cases where the Development is likely to reduce light to key windows the study has compared results against the BRE criteria.

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.

3.2 Average Daylight Factor

The Average Daylight Factor (ADF) method calculates the average illuminance within a room as a proportion of the illuminance available to an unobstructed point outdoors under a sky of known luminance and luminance distribution. This is the most detailed of the daylight calculations and considers the physical nature of the room behind the window, including; window transmittance, and surface reflectivity.

This method of quantifying the availability of daylight within a room does, however, require the internal layout to be known and is generally only used for establishing daylight provision in new rooms. The BRE Guide sets out the following guidelines for the assessment of the 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. In dwellings, the following minimum

average daylight factors should be achieved: 1% in bedrooms, 1.5% in living rooms and 2% in kitchens.

3.3 No Sky Line

The No Sky Line, or sometimes referred to as No Sky View method, describes the distribution of daylight within rooms by calculating the area of the 'working plane', which can receive a direct view of the sky. The working plane height is generally set at 850mm above floor level within a residential property and 700mm within a commercial property.

If a significant area of the working plane lies beyond the NSL, i.e. this area of the room has no view of the sky at the working plane height, there is likely to be a poor distribution of daylight within the room. However, this test is relatively simplistic and based purely on geometric parameters. Consequently, no account is taken of the reflectance of light within the room.

The BRE Guidelines do recommend that the NSL test is applied alongside the ADF test, and this is primarily to provide an indication of how well the daylight within the room is distributed. The determination of the level of adequacy of natural daylighting is, however, still predominantly driven by the ADF target values. Notwithstanding this, the NSL test does provide useful information on the way that the daylight is distributed within a room and this is often useful to the designer. The NSL test has therefore been undertaken alongside the ADF analysis and the graphical and numerical outputs are included within the appendix to this report. These results are, however, only used in a qualitative and informative way, rather than a quantitative pass/fail manner.

3.4 Room Depth Criteria

The BRE Guidelines do include advice for determining recommended room depths to proposed new rooms under specific circumstances using the Room Depth Criteria (RDC). This is more of a rule-of-thumb test that can be used to plan building layouts etc at an early conceptual stage, rather than providing quantitative outputs at the more detailed stage of a development.

This test has numerous limitations when being applied to anything but a simplistic room layout and does not take into account external obstructions. It is therefore not considered to provide any meaningful data on the level or distribution of daylight that is not already provided by the ADF and NSL tests. Consequently, it is only applied in very particular situations.

3.5 Annual Probable Sunlight Hours

It is also possible to quantify the amount of sunlight available to a new development and the recognised methodology for undertaking this analysis is the Annual Probable Sunlight Hours (APSH) method.

For a typical development to be considered as having very good levels of direct sunlight, the centre point of the window would ideally need to receive more than 25% of APSH for the year, including at least 5% in the winter months between 21st September and the 21st March.

The BRE Guidelines also recommend having at least one main window of the proposed development facing within 90 degrees of due south, with priority given to living rooms where sunlight is especially appreciated in the afternoon. Bedrooms and kitchens are generally viewed as less important, where occupants

normally prefer sunlight in the mornings. 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.

3.6 Overshadowing

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.

4 Assessment Methodology

4.1 Method of Baseline Data Collation

The following data and information has been used to inform this study:

- OS Mastermap mapping
- Measured survey data (Sitech Surveying Services – June 2021)
- Scheme drawings in AutoCAD format (DHA Planning – October 2021)
- 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 5.0.0.6) software package.

4.3 Calculation Assumptions

The following assumptions have been made when undertaking the analysis:

- When assessing the ADF 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.

Location / setting	Building type (Residential – good maintenance)	Exposure (normal)	Special exposure	Maintenance Factor
Urban	8%	x 1.0	x 1.0	0.92
Rural / suburban	4%	x 1.0	x 1.0	0.96

Table 4.1 – Parameters used for deriving Maintenance Factor (refer to BS 8206-2:2008 Tables A3, A4 and A5)

- The reflectance values used in the ADF analysis of the proposed new buildings are shown in table 4.2 below and are used unless specified otherwise by the designer:

Surface	Value
Internal walls (painted pale cream)	81%
Internal ceiling (painted white)	85%
Internal flooring	30%

Table 4.2 – Reflectance values used in ADF analysis

- Where the results of the detailed analysis are presented in the appendix to 2 decimal places, these values may be rounded to a single decimal place when interpreting the results and discussing compliance with assessment criteria. This is to fit with the convention adopted within the BRE Guidelines where all ratio of change and absolute daylighting values are expressed to one decimal place.

5 Daylight Provision to Proposed New Rooms

5.1 Overview

As discussed in Section 4, the primary test for daylight is the Average Daylight Factor (ADF) test and this is discussed in detail in the following section. The No Sky Line (NSL) analysis has also been carried out to provide supporting information on the distribution of daylight within each of the habitable rooms. The NSL results are processed by the computational model in both graphical and numerical formats and these are included in the appendix to this report.

5.2 Average Daylight Factor

Using the analytical techniques and assumptions discussed in Sections 3 and 4, the daylighting tests have been applied for the habitable rooms within the proposed development.

In accordance with the guidance set out in both the BRE Guidelines and the BS 8206-2:2008 document, rooms that have a dual use, i.e. an open plan kitchen and lounge, are assessed as a single room and assessed against the room use with the highest daylighting requirement. For example, where a room includes both living and kitchen spaces, then the higher daylighting requirement of the kitchen is adopted as the threshold target.

However, it should be noted that the industry recognises that the principal or dominant use of rooms design as LKDs is a living room, especially when the kitchen area represents a small proportion of the overall room. Therefore, basing

the ADF target value on the dominant room use means that a value of 1.5% would represent a reasonable and acceptable level of retained daylight within the room.

The results are summarised in Table 5.1.

Unit number	Room number and use	BRE Target ADF value	ADF value achieved	Meets BRE criteria
Flat A	R1 - Bedroom	1.0%	2.5%	Yes
	R2 - LKD	2.0%	3.0%	Yes
	R3 – Bedroom	1.0%	1.6%	Yes
	R4 – Office/Hobby Room	1.0%	1.5%	Yes
Flat B	R1 – LKD	2.0%	1.6%	No*
	R2 – Bedroom	1.0%	2.3%	Yes
Flat C	R1 – LKD	2.0%	1.7%	No*
	R2 – Bedroom	1.0%	2.2%	Yes
Flat D	R1 – LKD	2.0%	2.00	Yes
	R2 – Bedroom	1.0%	3.1%	Yes

Table 5.1 – Calculated ADF values

From the results in Table 5.1 it can be seen that all but two rooms within the proposed development exceed the minimum required ADF target values prescribed by the BRE Guidelines. Furthermore, the results of the NSL test included in Appendix A.3. indicate that all of the main habitable rooms (LKDs) and all of the principle bedrooms rooms will enjoy excellent levels of daylight distribution to over 80% of their room area.

* There are two LKD rooms which are falling short of the aspirational BRE target of 2.0% ADF. However, it should be noted that both of these rooms will achieve an ADF value of greater than 1.5% which is the acceptable level of daylight for a living or dining room.

There is no relevant planning guidance or policy relating to daylight availability provided by Gravesham Borough Council, however, it should be noted that recent supplementary planning guidance for London Boroughs from the Mayor of London's Housing Design Quality and Standards (Pre-consultation Draft 2020) states the following:

'BRE guidelines confirm that the acceptable minimum average daylight factor target value depends on the room use. That is 1 per cent for a bedroom, 1.5 per cent for a living room and 2 per cent for a family kitchen. In cases where one room serves more than one purpose, the minimum ADF should be that for the room type with the higher value. Notwithstanding this, the independent daylight and sunlight review states that in practice, the principal use of rooms designed as a 'living room/kitchen/dining room' is as a living room. Accordingly, it would be reasonable to apply a target of 1.5 per cent to such rooms'.

The proposal is a development of an existing building and therefore the ability to include additional windows is restricted by the current building design. Given that *the NPPF (2021) advocates a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site* and given that the daylight levels exceed London Planning Guidance, the *daylighting levels should be considered adequate*.

6 Sunlight Provision to Proposed Development

6.1 Annual Probable Sunlight Hours Assessment

The BRE Guidelines provide guidance in respect of sunlight quality for new developments stating: "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 assessment criteria set out within the BRE document are discussed in Section 4.3 of this report, but in general terms the overall objective sought by the guidelines is 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 21st September and 21st March"*.

It is also worth noting that in paragraph 3.1.11 of the BRE guidance it is suggested that if a room faces significantly north of due east or west it is unlikely to meet the recommended levels of sunlight. A further observation from paragraph 5.3 of the BS 8206-2 is that with regards to sunlight duration, the degree of satisfaction is related to the expectation of sunlight. Therefore, if a room

is 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.

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.

Following the approach prescribed by the BRE Guidelines where preference for sunlight is given to the main living area of a proposed unit, in this case, the Living/ Kitchen/ Dining (LKD) areas, only the LKD rooms within the proposed units have been included in the table of results below. The complete set of results of the APSH analysis which includes the remainder rooms within the units (all bedrooms) are presented on Appendix A.3 of this report.

The results of this analysis are summarised in Table 6.1.

Unit number	Room number and use	Percentage APSH (Room Total)		Meets BRE criteria
		All Year	Winter	
Flat A	R2 - LKD	39%	8%	Yes
Flat B	R1 – LKD (windows 3°N)	7%	0%	No*
Flat C	R1 – LKD (windows 3°N)	6%	0%	No*
Flat D	R1 – LKD (windows 3°N)	4%	0%	No*

Table 6.1 – Results of APSH Analysis

The results above show that Flat A will receive in excess of the aspirational target values for sunlight and is therefore fully compliant with the BRE Guidelines.

*With regards to the remaining units, it should first be noted that the proposal is for the conversion of an existing building, and it is therefore necessary to have north facing windows in order to make efficient use of the site. This is supported by the NPPF (2021) which states that '*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*'.

All of the external windows in Flats B, C and D face almost exactly due north at 3°N which is because the design of the existing building does not allow for any south or east facing windows on the ground floor level. Consequently, these units will receive lower levels of direct sunlight.

However, the BS 8206-2 states that '*the degree of satisfaction is related to the expectation of sunlight. Therefore, if a room is 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*'.

It should also be noted that the proposed large north facing windows have an unobstructed view of the Thames Estuary which provides a valuable amenity to these units in the absence of a high level of direct sunlight.

7 Conclusions

The detailed analysis undertaken as part of this assessment has examined the provision of natural daylight and sunlight to the habitable rooms for the proposed development at Warren Hastings Court, Clifton Marine Parade, Gravesend DA11 9NB. Using detailed numerical modelling applications, the Average Daylight Factor (ADF) and Annual Probable Sunlight Hours (APSH) have been quantified for each room. In line with the assessment criteria prescribed by the BRE Guidelines, it has been shown that for all rooms, the provision of natural daylight will meet or exceed the minimum required threshold set out in either the BRE Guidelines and/or the Mayor of London SPG on Housing Design Quality and Standards. Consequently, it can be concluded that these habitable spaces will be reasonably well lit and will have a reduced reliance on supplementary electric lighting.

It has also been possible to demonstrate that in Flat A, the main living area will receive in excess of the 'all year' and 'winter' target levels of direct sunlight. As a consequence of the light and additional visual interest provided by this direct sunlight, the amenity value of this unit will be enhanced.

For the units that fall short of meeting the aspirational target value for sunlight, it has been shown that this is primarily due to the orientation and design of the existing building that does not allow for windows to face south or east, resulting in windows facing due north. This should be considered more acceptable in this

case as the development is for the conversion of an existing office building. In order to make efficient use of the site, as the NPPF (2021) recommends, and to utilise the unobstructed views of the Thames Estuary, inevitably, the scheme includes north facing units.

A Appendices

Appendix A.1 – Scheme Drawings

Appendix A.2 – Graphical Model Outputs

Appendix A.3 – Tabulated Results for Daylight & Sunlight Calculations (Provision to New Development)

Appendix A.1 – Scheme Drawings

River Thames

CLIFTON MARINE PARADE

Ellandaye House

PIER ROAD

Warren Hastings Court

AMENITY COURTYARD
(for existing flats)

PARKING COURTYARD
(reconfigured to provide for
12 No parking spaces)

Fire escape door
at ground floor

Means of escape from fire
exit door and fire corridor
connecting flats A-D

pavement

Retaining wall to upper elevated
level overlooking Clifton Marine Parade

Existing Traffic Regulation Order (TRO)
to be amended to provide for 4 No
unallocated on-street parking bays

4 No parking spaces

Entrance
flats C-D

Entrance
flats A-B

4

52

G3

Proposed Site Layout Plan
1:250 @ A3

0 2 4 6 8 10
Metres (1:250)



Rev: Reason: Date:

Client:

BILLINGS GROUP

Project:

WARREN HASTINGS COURT, CLIFTON MARINE
PARADE, GRAVESEND, KENT, DA11 9NB

Title:

PROPOSED SITE LAYOUT PLAN

Drawing No: Rev: Scale: Date:

DHA/14980/10 1:250 OCT 2021



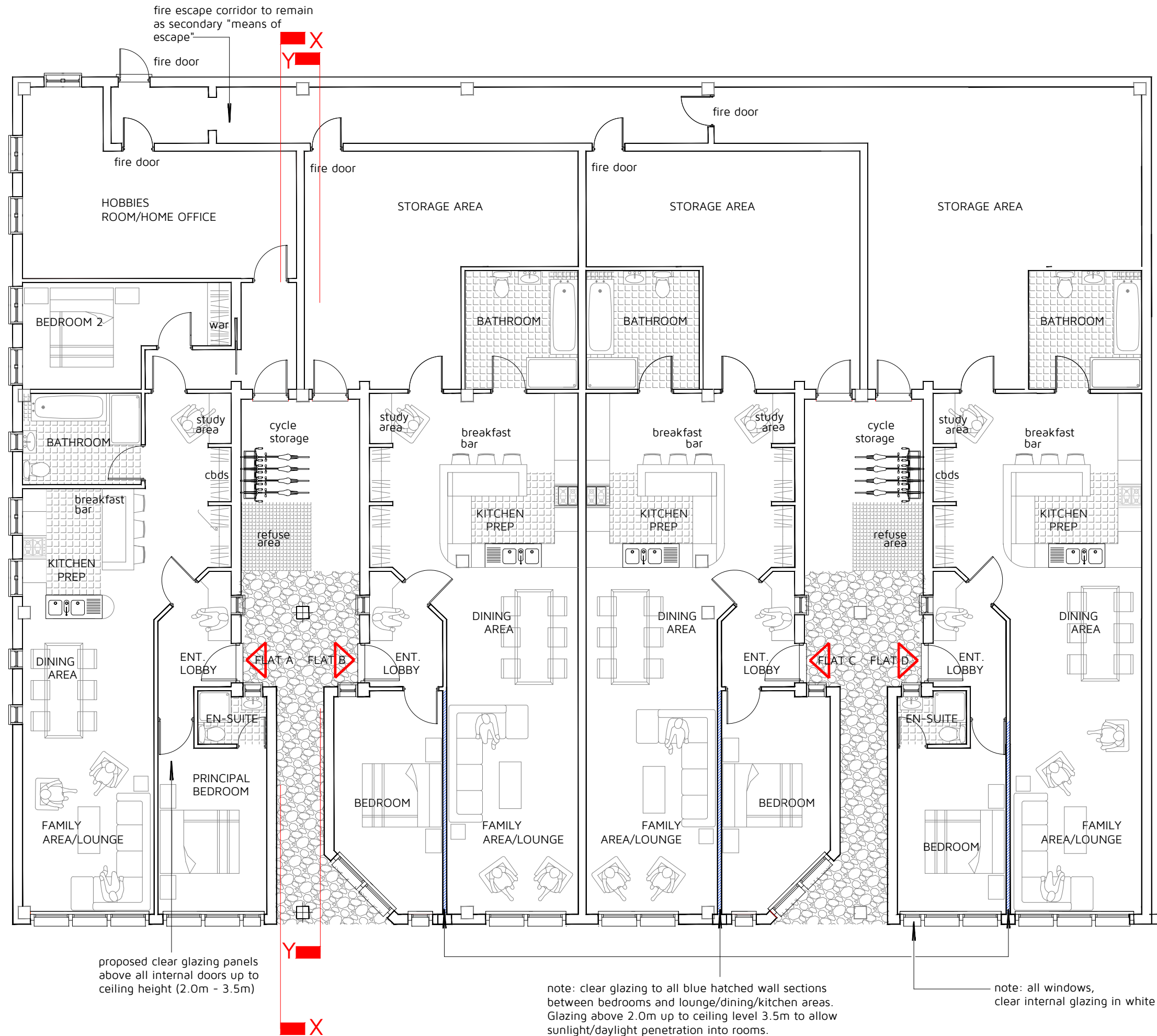
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FLOOR SPACE ACCOMMODATION
SCHEDULE G.I.A. (gross internal areas)

UNIT A....120 sq m (2 bed dwelling)
UNIT B....115 sq m (1 bed dwelling)
UNIT C....115 sq m (1 bed dwelling)
UNIT D....133 sq m (1 bed dwelling)

1 No car space per dwelling with
additional 2 No shared visitor spaces
to designated car park at upper level

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BILLINGS GROUP
Project:
WARREN HASTINGS COURT, CLIFTON MARINE
PARADE, GRAVESEND, KENT, DA11 9NB
Title:
BUILDING CONVERSION
PROPOSED GROUND FLOOR PLAN
Drawing No: Rev: Scale: Date:
DHA/14980/11 1:100 OCT 2021



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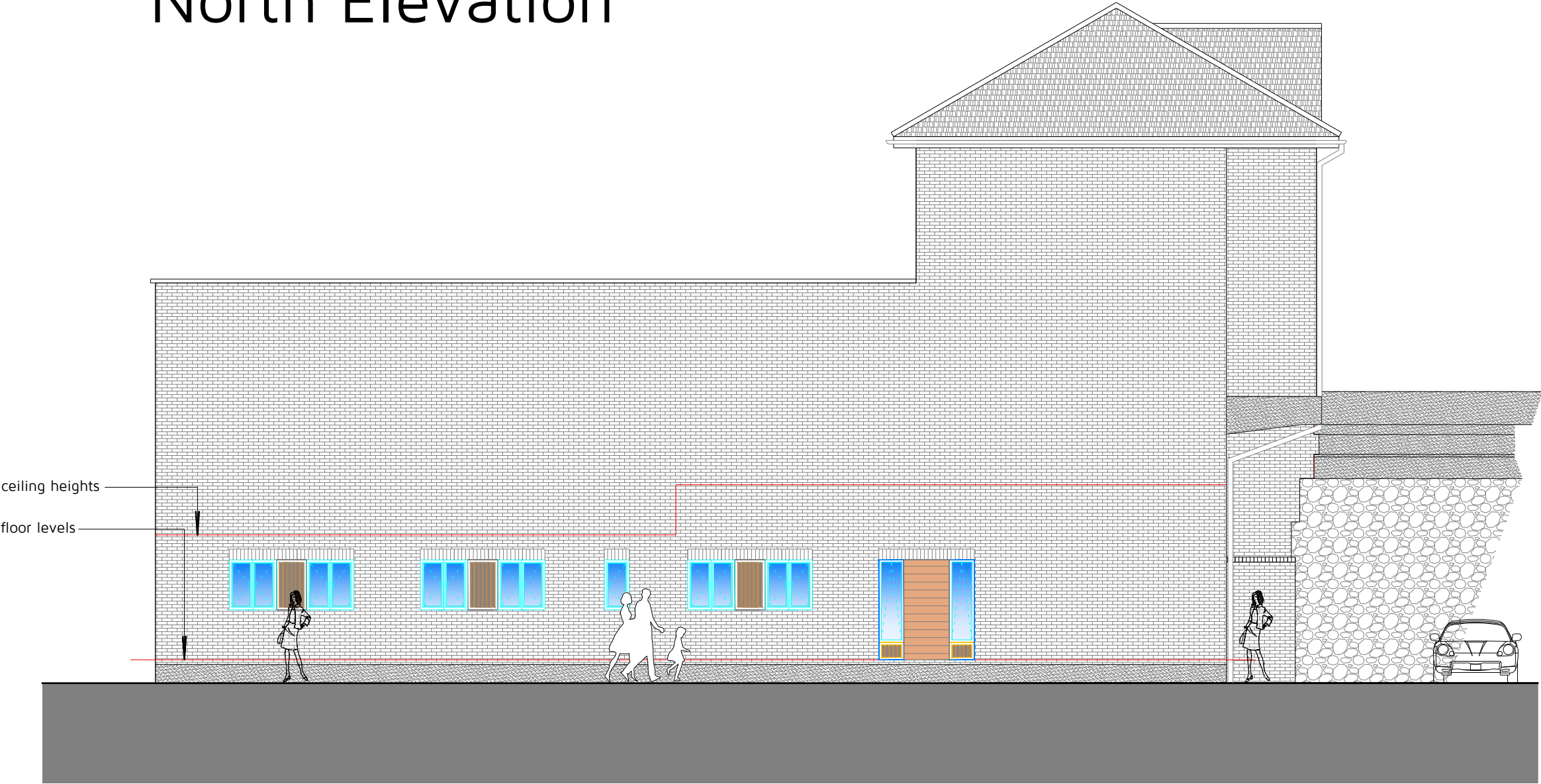
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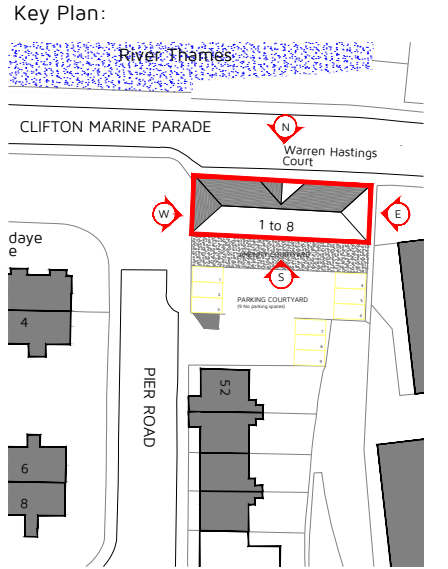
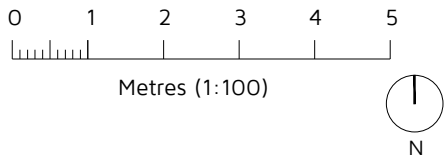
Proposed Ground Floor Plan
1:100 @ A3



North Elevation



East Elevation



MATERIALS SPECIFICATION

Main brickwork facade retained to unify proposals with brick soldier course detail to window and door heads. Full 3.0m high glazed feature panels with feature wooden grain effect panelling. Brushed steel and safety glass balcony detailing to private patio areas.

Rev: Reason: Date:

Client: BILLINGS GROUP

Project: WARREN HASTINGS COURT, CLIFTON MARINE PARADE, GRAVESEND, KENT, DA11 9NB

Title: PROPOSED CONVERSION NORTH AND EAST ELEVATIONS

Drawing No: DHA/14980/12 Rev: Scale: 1:100 Date: OCT 2021

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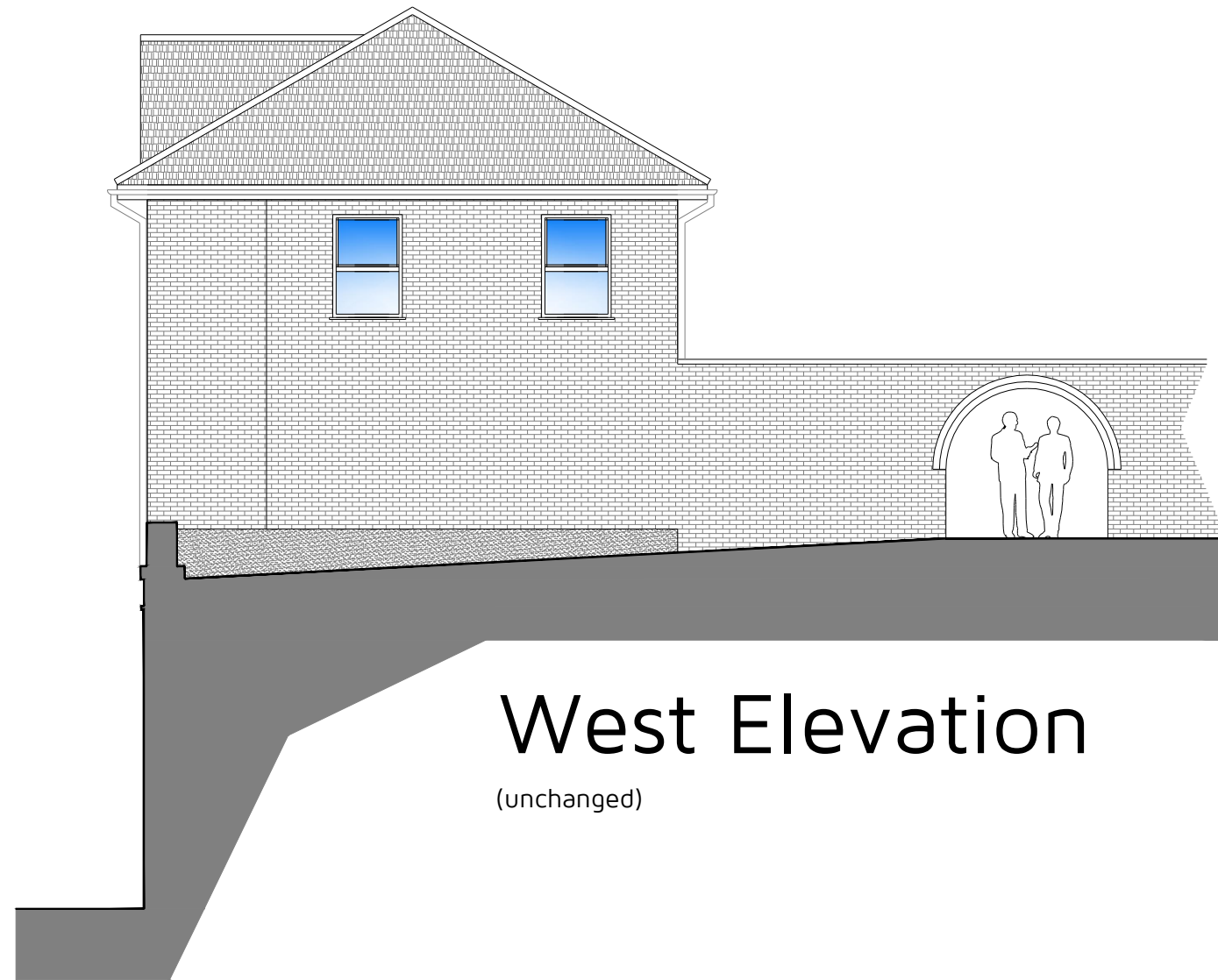
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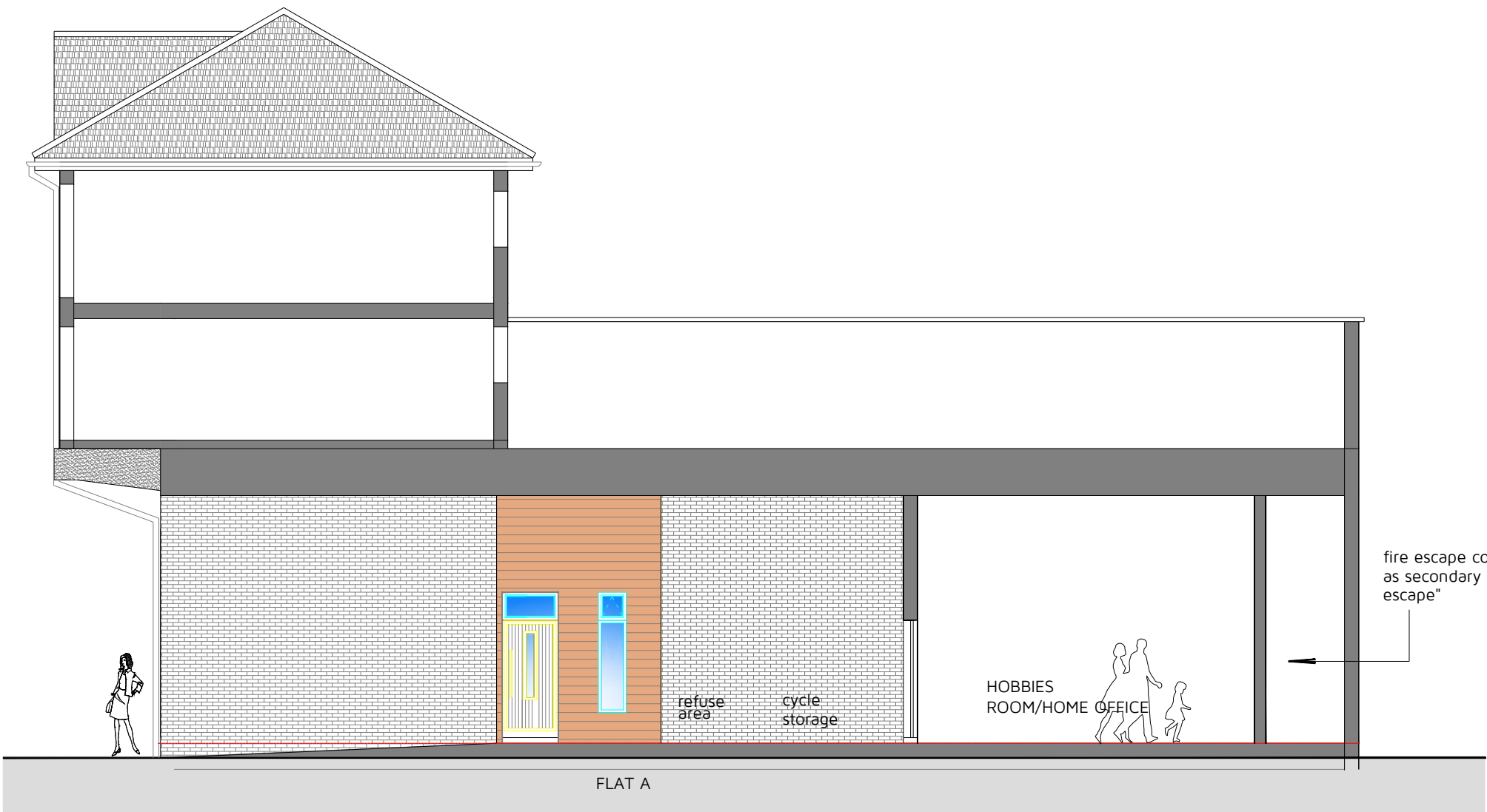
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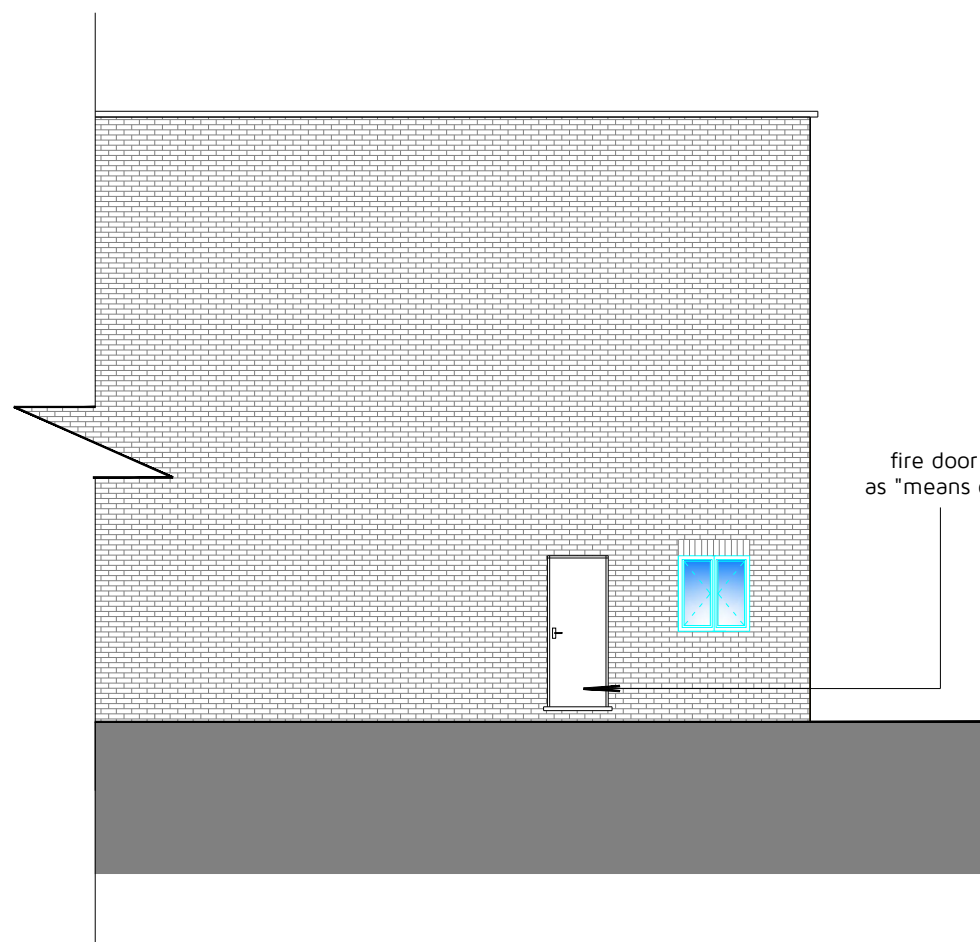
CAD Reference: DHA_14980_WARREN HASTINGS COURT_PFS10 A2



West Elevation
(unchanged)



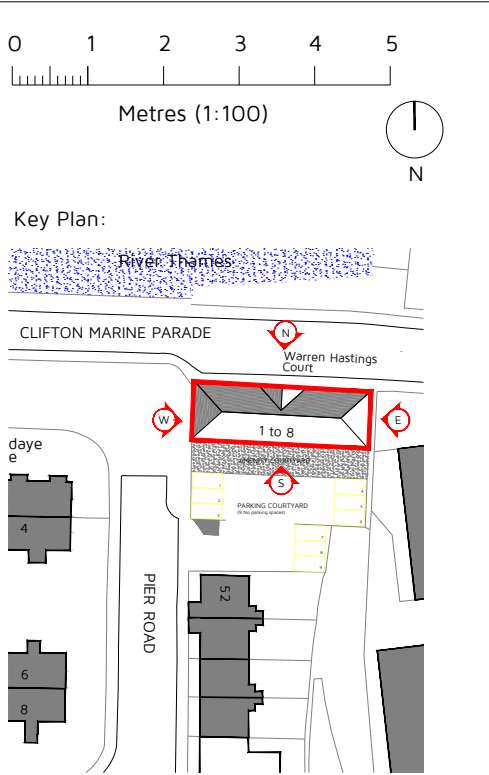
Building Cross-Section X-X



South Elevation



Building Cross-Section Y-Y



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Project: WARREN HASTINGS COURT, CLIFTON MARINE PARADE, GRAVESEND, KENT, DA11 9NB

Title: PROP CONVERSION, WEST & SOUTH ELEVATION
TYPICAL BUILDING CROSS SECTIONS X-X,Y-Y

Drawing No: DHA/14980/13 Rev: 1 Scale: 1:100 Date: OCT 2021

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Appendix A.2 – Graphical Model Outputs



Unit 6 - Barham Business Park
Elham Valley Road
Canterbury
Kent CT4 6DQ

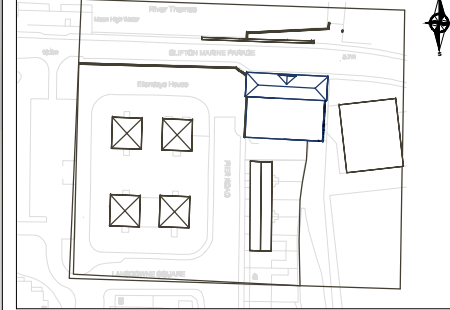
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Clifton Marine Parade

Legend

- Proposed Buildings
- Surrounding Buildings

Location Plan



00	First issue	27/10/2021
Rev	Description	Date

CLIENT
Grays Thurrock Properties Ltd

PROJECT
Clifton Marine Parade, Gravesend

SCALE	PROJ REF	ANALYST	DRAWN BY
Not to scale	3149	KC	JP

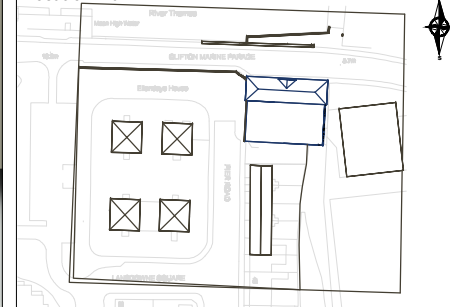
DWG REF 3D Model - Proposed Site Plan	DWG No. 3149_01
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Legend

- Proposed Buildings
- Surrounding Buildings

Location Plan



00	First issue	27/10/2021
Rev	Description	Date

CLIENT

Grays Thurrock Properties Ltd

PROJECT

Clifton Marine Parade, Gravesend

SCALE

Not to scale

PROJ REF

3149

ANALYST

KC

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JP

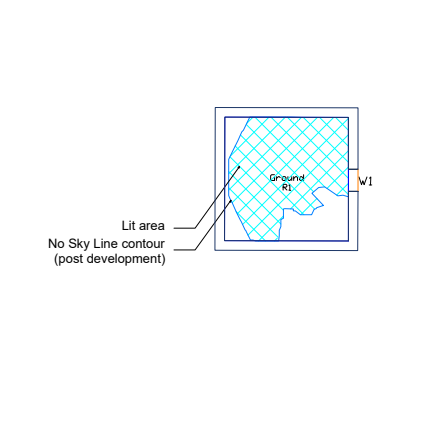
DWG REF

3D Model - Proposed Site Scenarios

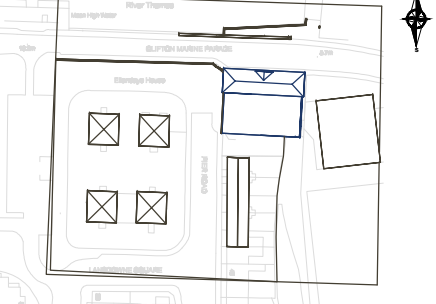
DWG No.

3149_02

Legend



Location Plan



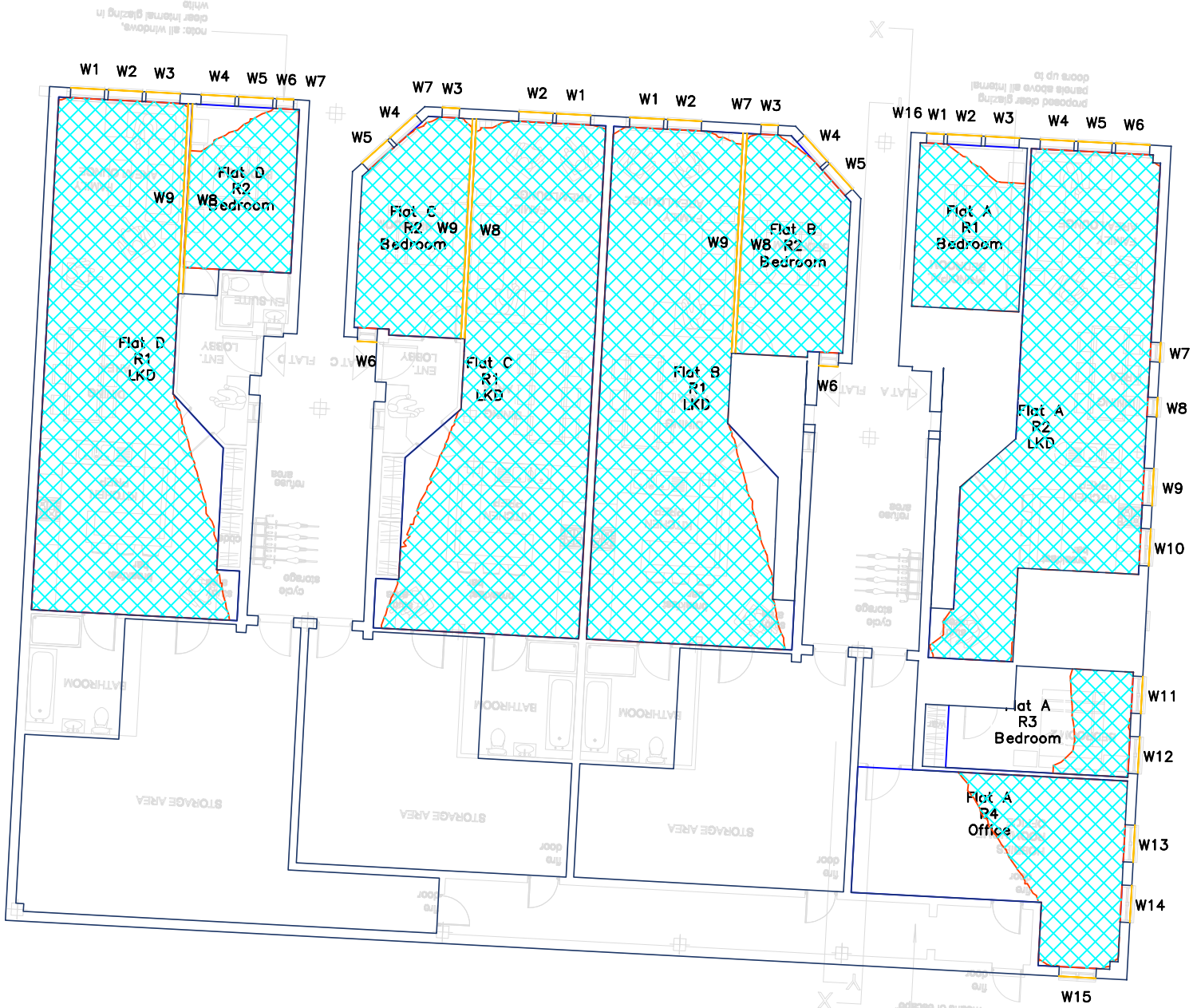
00	First issue	27/10/2021
Rev	Description	Date

CLIENT
Grays Thurrock Properties Ltd

PROJECT
Clifton Marine Parade, Gravesend

SCALE	PROJ REF	ANALYST	DRAWN BY
Not to scale	3149	KC	JP

DWG REF Daylight distribution contours	DWG No. 3149_03
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Appendix A.3 – Tabulated Results for Daylight and Sunlight Calculations (Provision to New Development)

Project Name: Clifton Marine Parade, Gravesend
Project No.: 3149
Report Title: Daylight Assessment - Proposed Scheme Analysis
Date: 26/10/2021
Average Daylight Factor Analysis

Floor Ref.	Room Ref.	Room Use.	Window Ref.	Glass Transmittance	Maintenance Factor	Glazed Area	Clear Sky Angle Proposed	Room Surface Area	Average Surface Reflectance	Below Working Plane Factor	ADF Proposed	BRE Req'd Value	Mayor of London Req'd Value
Flat A													
Ground	R1	Bedroom	W1	0.78	0.96	0.40	56.34	71.75	0.65	1.00	0.41		
		Bedroom	W2	0.78	0.96	0.82	59.72	71.75	0.65	1.00	0.90		
		Bedroom	W3	0.78	0.96	0.82	59.78	71.75	0.65	1.00	0.90		
		Bedroom	W16-L	0.35	0.96	0.27	57.08	71.75	0.65	0.15	0.02		
		Bedroom	W16-U	0.35	0.96	0.43	64.87	71.75	0.65	1.00	0.23		
											2.5	1.0	1.0
Ground	R2	LKD	W4-L	0.78	0.96	0.54	58.67	214.21	0.65	0.15	0.03		
		LKD	W4-U	0.78	0.96	1.66	66.72	214.21	0.65	1.00	0.67		
		LKD	W5-L	0.78	0.96	0.54	58.56	214.21	0.65	0.15	0.03		
		LKD	W5-U	0.78	0.96	1.66	67.80	214.21	0.65	1.00	0.69		
		LKD	W6-L	0.78	0.96	0.54	55.51	214.21	0.65	0.15	0.03		
		LKD	W6-U	0.78	0.96	1.66	70.27	214.21	0.65	1.00	0.71		
		LKD	W7-L	0.78	0.96	0.20	58.60	214.21	0.65	0.15	0.01		
		LKD	W7-U	0.78	0.96	0.46	59.37	214.21	0.65	1.00	0.17		
		LKD	W8-L	0.78	0.96	0.20	55.91	214.21	0.65	0.15	0.01		
		LKD	W8-U	0.78	0.96	0.46	56.79	214.21	0.65	1.00	0.16		
Ground	R3	Bedroom	W11	0.78	0.96	0.76	47.82	58.44	0.65	1.00	0.81		
		Bedroom	W12	0.78	0.96	0.76	47.88	58.44	0.65	1.00	0.81		
Ground	R4	Office	W13	0.78	0.96	0.76	48.73	109.99	0.65	1.00	0.44		
		Office	W14	0.78	0.96	0.76	49.62	109.99	0.65	1.00	0.45		
		Office	W15	0.78	0.96	0.76	65.46	109.99	0.65	1.00	0.59		
											1.5	1.0	1.0
Flat B													
Ground	R1	LKD	W1-L	0.78	0.96	0.53	54.42	229.22	0.65	0.15	0.02		
		LKD	W1-U	0.78	0.96	1.66	66.17	229.22	0.65	1.00	0.62		
		LKD	W2-L	0.78	0.96	0.53	57.86	229.22	0.65	0.15	0.03		
		LKD	W2-U	0.78	0.96	1.66	66.16	229.22	0.65	1.00	0.62		
		LKD	W8	0.78	0.96	6.78	8.97	229.22	0.65	1.00	0.35		
											1.6	2.0	1.5
Ground	R2	Bedroom	W3	0.78	0.96	0.40	56.35	83.68	0.65	1.00	0.35		
		Bedroom	W4	0.78	0.96	0.82	44.20	83.68	0.65	1.00	0.57		
		Bedroom	W5	0.78	0.96	0.82	36.22	83.68	0.65	1.00	0.47		
		Bedroom	W6	0.78	0.96	0.20	0.00	83.68	0.65	1.00	0.00		
		Bedroom	W7-L	0.35	0.96	0.26	57.58	83.68	0.65	0.15	0.02		
		Bedroom	W7-U	0.35	0.96	0.43	64.77	83.68	0.65	1.00	0.19		
		Bedroom	W9	0.78	0.96	6.78	6.44	83.68	0.65	1.00	0.68		
											2.3	1.0	1.0

Project Name: Clifton Marine Parade, Gravesend
 Project No.: 3149
 Report Title: Daylight Assessment - Proposed Scheme Analysis
 Date: 26/10/2021
 Average Daylight Factor Analysis

Floor Ref.	Room Ref.	Room Use.	Window Ref.	Glass Transmittance	Maintenance Factor	Glazed Area	Clear Sky Angle Proposed	Room Surface Area	Average Surface Reflectance	Below Working Plane Factor	ADF Proposed	BRE Req'd Value	Mayor of London Req'd Value
Flat C													
Ground	R1	LKD	W1-L	0.78	0.96	0.46	64.02	229.24	0.65	0.15	0.03		
		LKD	W1-U	0.78	0.96	1.72	62.59	229.24	0.65	1.00	0.61		
		LKD	W2-L	0.78	0.96	0.46	65.90	229.24	0.65	0.15	0.03		
		LKD	W2-U	0.78	0.96	1.72	62.58	229.24	0.65	1.00	0.61		
		LKD	W9	0.78	0.96	6.78	9.87	229.24	0.65	1.00	0.38	1.7	2.0
Ground	R2	Bedroom	W3	0.78	0.96	0.40	51.14	83.67	0.65	1.00	0.32		
		Bedroom	W4	0.78	0.96	0.82	39.49	83.67	0.65	1.00	0.51		
		Bedroom	W5	0.78	0.96	0.82	32.46	83.67	0.65	1.00	0.42		
		Bedroom	W6	0.78	0.96	0.20	0.00	83.67	0.65	1.00	0.00		
		Bedroom	W7-L	0.35	0.96	0.23	62.01	83.67	0.65	0.15	0.02		
		Bedroom	W7-U	0.35	0.96	0.46	63.27	83.67	0.65	1.00	0.20		
		Bedroom	W8	0.78	0.96	6.78	7.10	83.67	0.65	1.00	0.75	2.2	1.0
Flat D													
Ground	R1	LKD	W1-L	0.78	0.96	0.46	45.28	229.15	0.65	0.15	0.02		
		LKD	W1-U	0.78	0.96	1.72	52.98	229.15	0.65	1.00	0.52		
		LKD	W2-L	0.78	0.96	0.46	51.50	229.15	0.65	0.15	0.02		
		LKD	W2-U	0.78	0.96	1.72	59.15	229.15	0.65	1.00	0.58		
		LKD	W3-L	0.78	0.96	0.46	54.29	229.15	0.65	0.15	0.02		
		LKD	W3-U	0.78	0.96	1.72	61.38	229.15	0.65	1.00	0.60		
		LKD	W8	0.78	0.96	5.85	8.52	229.15	0.65	1.00	0.28	2.0	2.0
Ground	R2	Bedroom	W4	0.78	0.96	0.82	53.70	71.75	0.65	1.00	0.81		
		Bedroom	W5	0.78	0.96	0.82	53.82	71.75	0.65	1.00	0.81		
		Bedroom	W6	0.78	0.96	0.40	51.14	71.75	0.65	1.00	0.37		
		Bedroom	W7-L	0.35	0.96	0.23	55.65	71.75	0.65	0.15	0.02		
		Bedroom	W7-U	0.35	0.96	0.46	63.31	71.75	0.65	1.00	0.24		
		Bedroom	W9	0.78	0.96	5.85	8.13	71.75	0.65	1.00	0.87	3.1	1.0

Project Name: Clifton Marine Parade, Gravesend
Project No.: 3149
Report Title: Daylight Assessment - Proposed Scheme Analysis
Date: 26/10/2021
No Sky Line Analysis

Floor Ref.	Room Ref.	Room Use.		Room Area	Lit Area Proposed	Meets BRE Criteria
Flat A						
Ground	R1	Principle Bedroom	Area m2	11.55	10.30	
			% of room		89.00%	YES
Ground	R2	LKD	Area m2	43.92	43.55	
			% of room		99.00%	YES
Ground	R3	Bedroom	Area m2	10.78	4.20	
			% of room		39.00%	NO
Ground	R4	Office	Area m2	25.58	13.68	
			% of room		53.00%	NO
Flat B						
Ground	R1	LKD	Area m2	51.48	49.09	
			% of room		95.00%	YES
Ground	R2	Bedroom	Area m2	14.10	13.99	
			% of room		99.00%	YES
Flat C						
Ground	R1	LKD	Area m2	51.43	49.18	
			% of room		96.00%	YES
Ground	R2	Bedroom	Area m2	14.09	14.01	
			% of room		99.00%	YES
Flat D						
Ground	R1	LKD	Area m2	51.41	49.26	
			% of room		96.00%	YES
Ground	R2	Bedroom	Area m2	11.55	10.16	
			% of room		88.00%	YES

Project Name: Clifton Marine Parade, Gravesend
 Project No.: 3149
 Report Title: Sunlight Assessment- Proposed Scheme Analysis
 Date of Analysis: 26/10/2021
 APSH Analysis

Floor Ref.	Room Ref.	Property Type	Room Use.	Window Ref.	Annual	Winter	Total Suns per Room Annual	Total Suns per Room Winter
Flat A								
Ground	R1	Residential	Bedroom	W1	6.00	0.00	8.00	0.00
				W2	7.00	0.00		
				W3	7.00	0.00		
				W16	8.00	0.00		
	R2	Residential	LKD	W4	8.00	0.00	39.00	8.00
				W5	8.00	0.00		
				W6	8.00	0.00		
				W7	34.00	8.00		
				W8	28.00	8.00		
				W9	30.00	8.00		
				W10	27.00	8.00		
	R3	Residential	Bedroom	W11	27.00	9.00	28.00	9.00
				W12	28.00	9.00		
	R4	Residential	Office	W13	28.00	9.00	64.00	20.00
				W14	29.00	9.00		
				W15	64.00	20.00		
Flat B								
Ground	R1	Residential	LKD	W1	7.00	0.00	7.00	0.00
				W2	7.00	0.00		
				W8	0.00	0.00		
	R2	Residential	Bedroom	W3	5.00	0.00	7.00	0.00
				W4	1.00	0.00		
				W5	0.00	0.00		
				W6	0.00	0.00		
				W7	7.00	0.00		
				W9	0.00	0.00		
Flat C								
Ground	R1	Residential	LKD	W1	6.00	0.00	6.00	0.00
				W2	6.00	0.00		
				W9	0.00	0.00		
	R2	Residential	Bedroom	W3	2.00	0.00	7.00	0.00
				W4	1.00	0.00		
				W5	0.00	0.00		
				W6	0.00	0.00		
				W7	7.00	0.00		
				W8	0.00	0.00		

Project Name: Clifton Marine Parade, Gravesend Project No.: 3149 Report Title: Sunlight Assessment- Proposed Scheme Analysis Date of Analysis: 26/10/2021 APSH Analysis								
Floor Ref.	Room Ref.	Property Type	Room Use.	Window Ref.	Annual	Winter	Total Suns per Room Annual	Total Suns per Room Winter
Flat D								
Ground	R1	Residential	LKD	W1	4.00	0.00	4.00	0.00
				W2	4.00	0.00		
				W3	4.00	0.00		
				W8	0.00	0.00		
	R2	Residential	Bedroom	W4	1.00	0.00	6.00	0.00
				W5	2.00	0.00		
				W6	2.00	0.00		
				W7	6.00	0.00		
				W9	0.00	0.00		