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Anglia Square, Norwich
Daylight and Sunlight Report
Internal Daylight, Sunlight & Overshadowing Report

Dated March 2022

Weston Homes

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CHARTERED SURVEYORS

DAYLIGHT & SUNLIGHT

INTERNAL DAYLIGHT, SUNLIGHT AND OVERSHADOWING REPORT

Anglia Square, Norwich

04 April 2022

GIA No: **17841**

PROJECT DATA:

Client	**Weston Homes Plc**
Architect	**Broadway Malyan**
Project Title	**Anglia Square, Norwich**
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Prepared by	**LG**
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CONTENTS

1 EXECUTIVE SUMMARY

The purpose of this report is to ascertain whether the proposed development will provide residential accommodation considered acceptable in terms of daylight and sunlight.

In order to gauge the overall performance of the scheme, a selection of units within the lowest residential storeys of the detailed plots have been technically assessed as a worst-case scenario. The daylight and sunlight availability will increase on the upper floors, where the sky visibility is greater.

The results show that 63% of the tested rooms will meet or exceed the levels of Average Daylight Factor recommended by BRE. Should all habitable rooms within the scheme be assessed, the level of compliance would increase further.

Good levels of sunlight are seen on most facades with a southerly aspect. Levels of sunlight lower than those suggested can be seen in some areas, particularly on the lowest storeys and below balconies as is to be expected in a scheme of this nature and size.

For the outline plots, daylight and sunlight potential assessments have been undertaken on the facades and these show that these plots have the potential to offer good daylight and sunlight amenity for the enjoyment of future occupants. Detailed assessments will be provided at detailed design stage.

Finally, a number of open spaces, both public and communal, are provided across the scheme and perform very well in terms of sunlight availability, overall.

Further details are provided in Section 5 and the full assessment results are provided in Sections 7, 8 and 9.

2 INTRODUCTION

GIA has been instructed to provide a report upon the potential availability of Daylight and Sunlight to the proposed accommodation within the residential scheme prepared by Broadway Malyan. GIA was specifically instructed to carry out the following:

- To create a 3D computer model of the proposal based upon drawings prepared by Broadway Malyan.
- Carry out a daylight assessment for the blocks proposed in detail using the methodologies set out in the BRE guidance for Average Daylight Factor, No-Sky Line and Room Depth Criterion.
- Carry out a daylight potential assessment for the blocks proposed in outline using the Vertical Sky Component (VSC) as defined within the BRE guidance.
- Carry out a sunlight assessment using the methodologies set out in the BRE guidance for Annual Probable Sunlight Hours (APSH) to the fenestration facing within 90° of due south.
- Carry out an overshadowing assessment using the methodology set out in the BRE guidance for Sun Hours On Ground (SHOG) for all relevant amenity areas.
- Prepare a report setting out the analysis and our findings.

3 BRE GUIDELINES

The Building Research Establishment (BRE) have set out in their handbook 'Site Layout Planning for Daylight and Sunlight a Guide to Good Practice (2011)', guidelines and methodology for the measurement and assessment of daylight and sunlight within proposed buildings.

This document states that it is intended to be used in conjunction with the daylight recommendations found within the British Standard BS8206-2:2008 and The Applications Manual on Window Design of the Chartered Institution of Building Services Engineers (CIBSE. 1999).

The guide also provides advice on site layout planning to determine the quality of daylight and sunlight within open spaces between buildings.

It is important to note, however, that this document is a guide and states that its aim *"is to help rather than constrain the designer"*.

The document provides advice, but also clearly states that it *"is not mandatory and this document should not be seen as an instrument of planning policy."* The report also acknowledges in its introduction that *"in special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings."*

It is an inevitable consequence of the built-up urban environment that daylight and sunlight will be more limited in these areas. It is well acknowledged that in such situations there may be many other conflicting and potentially more important planning and urban design matters to consider other than just the provision of ideal levels of daylight and sunlight.

In May 2019 the British Standard BS8206-2:2008 was superseded by the new European Standard on daylight "BS EN 17037:2018 Daylight in buildings". The Standard adopts a new methodology for testing daylight and sunlight in proposed developments based on climatic data as opposed the 'Standard CIE overcast sky' adopted in BS8206-2:2008, and also includes views out and glare.

Following on from the review of the European Standard by a dedicated commission of UK experts (which included the author of the BRE BR209 guidance Dr. Paul Littlefair), the British Standard Institution appended to BS EN 17037:2018 a UK National Annex which brings the recommended light levels in line with those of BS8206-2:2008.

BRE is currently looking to update and re-publish BR209 to align their guidance with the new BS EN 17037:2018 in 2020. Until then, the position of BRE can be summarised from a post by Dr. Littlefair on the LinkedIn Planning Daylight & Sunlight Group (BRE BR209): *"Until BR 209 is rewritten, we are adopting a flexible approach to applying the two standards, for example in assessing the daylight and sunlight available in new buildings. So, for example, if we were reviewing a daylight report for a local authority, we would consider it reasonable to accept either average daylight factor tables using BS 8206 or median daylight factors/median illuminance calculated using EN 17037, provided they were calculated and presented properly"*.

Given the above and the reference to the BRE guidance in planning policies, the assessments within this report are carried out with the criteria and methodologies set out in BRE BR209 and BS8206-2:2008. It is not considered that calculations undertaken according to BS EN 17037:2018 would alter the conclusions meaningfully.

2.1 DAYLIGHT

The BRE set out various methods for assessing the daylight within a proposed building within section 2.1 and Appendix C of the handbook. These are summarised below.

Vertical Sky Component (VSC)

This method of assessment can be undertaken using a skylight indicator or a Waldram diagram. It measures from a single point, at the centre of the window (if known at the early design stage), the quantum of sky visible taking into account all external obstructions. Whilst these obstructions can be either other buildings or the general landscape, trees are usually ignored unless they form a continuous or dense belt of obstruction.

The VSC method is a useful 'rule of thumb' but has some significant limitations in determining the true quality of daylight within a proposed building. It does not take into account the size of the window, any reflected light off external obstructions, any reflected light within the room, or the use to which that room is put. Appendix C of the guide goes into more detail on these matters and sets forward alternative methods for assessment to overcome these limitations.

Appendix C of the BRE guide: Interior Daylighting Recommendations, states:

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

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

These assessments are set out below.

Average Daylight Factor (ADF)

"If a predominantly daylit appearance is required, then the ADF should be 5% or more if there is no supplementary electric lighting, or 2% or more if supplementary electric lighting is provided. There are additional recommendations for dwellings of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms. These additional recommendations are minimum values of ADF which should be attained even if a predominantly daylit appearance is not achievable."

This method of assessment takes into account the total glazed area to the room, the transmittance quality of the glazing proposed, the total area of the room surfaces including ceilings and floors, and the internal average reflectance for the room being assessed. The method also takes into account the Vertical Sky Component and the quantum of reflected light off external surfaces.

This is, therefore, a significantly more detailed method of assessment than the Vertical Sky Component method set out above.

Room Depth Criterion (RDC)

Where it has access to daylight from windows in one wall only, the depth of a room can become a factor in determining the quantity of light within it. The BRE guidance provides a simple method for examining the ratio of room depth to window area. However, whilst it does take into account internal surface reflections, this method also has significant limitations in that it does not take into account any obstructions outside the window and therefore draws no input from the quantity of light entering the room.

No Sky Line (NSL)

This third method of assessment is a simple test to establish where within the proposed room the sky will be visible through the windows, taking into account external obstructions. The assessment is undertaken at working plane height (850mm above floor level) and the method of calculation is set out in Appendix D of the BRE handbook.

Appendix C of the BRE handbook states *"If a significant area of the working plane (normally more than 20%) lies beyond the no sky line (ie it receives no direct skylight) then the distribution of daylight in*

the room will look poor and supplementary electric lighting will be required." To guarantee a satisfactory daylight uniformity, the area which does not receive direct skylight should not exceed 20% of the floor area, as quantified in the BS 8206 Part 2 2008.

Summary

The Average Daylight Factor gives a more detailed assessment of the daylight within a room and takes into account the highest number of factors in establishing a quantitative output.

However, the conclusion of Appendix C of the BRE guide states:

"[All three of] the criteria need to be satisfied if the whole of the room is to look adequately daylit. Even if the amount of daylight in a room (given by the Average Daylight Factor) is sufficient, the overall daylight appearance will be impaired if its distribution is poor."

In most urban areas it is important to recognise that the distribution of daylight within a room may be difficult to achieve, given the built-up nature of the environment. Consequently, most local authorities seek to ensure that there is sufficient daylight within the room as determined by the Average Daylight Factor calculation. However, the additional recommendations of the BRE and British Standard for residential accommodation, set out above, ought not to be overlooked.

2.2 SUNLIGHT

The BRE provide guidance in respect of sunlight quality for new developments within section 3.1 of the handbook. It is generally acknowledged that the presence of sunlight is more significant in residential accommodation than it is in commercial properties, and this is reflected in the BRE document.

It states, *"in housing, the main requirement for sunlight is in living rooms, where it is valued at any time of the day, but especially in the afternoon. Sunlight is also required in conservatories. It is viewed as less important in bedrooms and in kitchens where people prefer it in the morning rather than the afternoon."*

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

The guide proposes minimizing the number of dwellings whose living room face solely north unless there is some compensating factor such as an appealing view to the north, and it suggests a number of techniques to do so. 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 82606-2 criterion of Annual Probable Sunlight Hours. APSH is defined as *"the total number of hours in the year that the sun is expected to shine on unobstructed ground, allowing for average levels of cloudiness at the location in question."* In line with the recommendation, APSH is measured from a point on the inside face of the window, should the locations have been decided. If these are unknown, sunlight availability is checked at points 1.6m above the ground or the lowest storey level on each main window wall, and no more than 5m apart. If a room has multiple windows on the same wall or on adjacent walls, the highest value of APSH should be taken into account. If a room has two windows on opposite walls, the APSH for each can be added together.

The summary of section 3.1 of the guide states as follows:

"In general, a dwelling or non-domestic building which has a particular requirement for sunlight, will appear reasonably sunlit provided that:

- *At least one main window faces within 90 degrees of due south, and*
- *The centre of at least one window to a main living room can receive 25% of annual probable sunlight hours, including at least 5% of annual probable sunlight hours in the winter months between 21 September and 21 March. "*

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

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

2.3 OVERSHADOWING

The BRE guidance in respect of overshadowing of amenity spaces is set out in section 3.3 of the handbook. Here it states as follows:

"Sunlight in the spaces between buildings has an important impact on the overall appearance and ambiance of a development. It is valuable for a number of reasons, to:

- *provide attractive sunlit views (all year)*
- *make outdoor activities, like sitting out and children's play more pleasant (mainly warmer months)*
- *encourage plant growth (mainly spring and summer)*
- *dry out the ground, reducing moss and slime (mainly in colder months)*
- *melt frost, ice and snow (in winter)*
- *dry clothes (all year)"*

Again, it must be acknowledged that in urban areas the availability of sunlight on the ground is a factor which is significantly controlled by the existing urban fabric around the site in question and so may have very little to do with the form of the development itself. Likewise, there may be many other urban design, planning and site constraints which determine and run contrary to the best form, siting and location of a proposed development in terms of availability of sun on the ground.

The summary of section 3.3 of the guide states as follows:

"3. 3 .17 It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March. If as a result of new development an existing garden or amenity area does not meet the above, and the area which can receive two hours of sun on 21 March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable. If a detailed calculation cannot be carried out, it is recommended that the centre of the area should receive at least two hours of sunlight on 21 March."

2.4 FURTHER RELEVANT INFORMATION

Further information can be found in The Daylight in Urban Areas Design Guide (Energy Saving Trust CE257, 2007) which provides the following recommendation with regards to VSC levels in urban areas:

"If 'theta' (Visible sky angle) is greater than 65° (obstruction angle less than 25° or VSC at least 27 percent) conventional window design will usually give reasonable results.

If 'theta' is between 45° and 65° (obstruction angle between 25° and 45°, VSC between 15 and 27 percent), special measures such as larger windows and changes to room layout are usually needed to provide adequate daylight.

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

If 'theta' is less than 25° (obstruction angle more than 65°, VSC less than 5 percent) it is often impossible to achieve reasonable daylight, even if the whole window wall is glazed."

4 METHODOLOGY

In order to undertake the daylight and sunlight assessments set out in the previous pages, we have prepared a three dimensional computer model and used specialist lighting simulation software.

The three dimensional representation of the proposed development has been modelled using the scheme drawings provided to us by Broadway Malyan. This has been placed in the context of its surrounding buildings which have been modelled from photogrammetry and OS. This allows for a precise model, which in turn ensures that analysis accurately represents the amount of daylight and sunlight available to the building facades, internal and external spaces, considering all of the surrounding obstructions and orientation.

4.1 SIMULATION ASSUMPTIONS

Where no values for reflectance, transmittance and maintenance factor were specified by the designer the following values from *BS 8206-2:2008, Annex A, tables A.1-A.6* were used for the calculation of Average Daylight Factor values. These values are shown in Table 1.

As is common in many new residential developments, kitchens are often located in the rear part of combined living/kitchen/dining rooms or kitchen/dining rooms. Being in the area of the room farthest away from the window, they typically receive lower levels of daylight than the rest of the room and will often require supplementary artificial lighting.

Where this is the case, and an area devoted to the kitchen function can be identified that is hierarchically separated from dining and living areas, this has been omitted from the calculations, and just the main habitable living area within the room has been assessed. This is reflected in the room labelling.

A light finish has been assumed for the floors.

Table 01: Typical reflectance, transmittance and maintenance factors

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

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

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

5 CONCLUSIONS

4.2 GENERAL CONSIDERATIONS

The Site is located in a highly accessible position within the northern part of Norwich City Centre and is of strategic importance to the City. Therefore, it has been identified for redevelopment within various planning policy documents. In particular, within Policy GNLP0506 of the emerging Greater Norwich Local Plan, the Anglia Square area is allocated for "residential-led, mixed-use development as the focus for an enhanced and improved large district centre and to act as a catalyst for wider investment and redevelopment within the Northern City Centre strategic regeneration area".

The design has therefore strived to meet the required densification of the area whilst respecting and enhancing its historical character. The proposed building typologies take into consideration and respond to the existing street patterns, defined by alleys, yards and courtyards, and maintain the tight-knit city grain, with its character and human scale.

Such city-centre urban grains are typically associated with lower daylight and sunlight availability on the lower floors, as the surrounding context inherently acts as an obstruction. This is a direct consequence of the character of the area. The area's allocation for redevelopment should be borne in mind, with particular reference to the National Planning Policy Framework ("NPPF", July 2021) which states that, when considering applications for housing, Local Authorities should take a "flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making an efficient use of a site".

4.3 CONCLUSIONS ON DAYLIGHT AND SUNLIGHT

DETAILED COMPONENT

In order to ascertain the levels of daylight within the proposed development, a selection of residential units have been assessed for daylight quantum (expressed as Average Daylight Factor or ADF) and distribution (expressed as No Sky Line or NSL, and Room Depth Criterion or RDC). Results are provided in Section 7 of this report.

The selection includes units on the lowest residential storeys, as a worst-case scenario. The daylight and sunlight availability will increase on the upper floors, where the sky visibility is greater.

The results show that 63% (376) of the 600 tested rooms will meet or exceed the levels of ADF recommended by the BRE Guidance. 45 additional LKDs and studios, whilst technically falling short of the 2% ADF recommended for multi-use rooms including a kitchen, would meet or exceed the 1.5% recommended for living rooms and so can be considered acceptably daylit living areas. Should these rooms be included in the overall percentage, this would increase to 70% (421).

As discussed above these percentage refer to a worst-case scenario and therefore, should all habitable rooms within the scheme be assessed, the level of compliance would increase further.

The sky visibility (NSL) is typically restricted on the lowest floors within any urban environment and this is especially true where balconies are also provided. The NSL assessment indicates that, for the selection of rooms assessed, 51% will see levels of sky visibility in line with or above the recommendation. However, the upper floors will have progressively greater levels of sky visibility due to the reduced external obstructions. It should also be noted that a number of rooms fall short marginally and 72% of the rooms within the assessed selection would have a direct view of the sky from at least 50% of their area. Whilst lower than the recommended 80%, this can be considered in line with expectations within dense urban environments.

Finally, most rooms have been designed in accordance with the RDC where applicable, allowing for a good distribution of the daylight available.

Overall, with the majority of habitable rooms on the lowest residential storeys achieving adequate levels of daylight and the upper floors expected to have a better performance, the proposed scheme can be considered acceptable in terms of internal daylight.

With regard to sunlight, the BRE state that it is most appreciated in living areas and the greatest expectation of sunlight is within south-facing rooms. Therefore, Probable Sunlight Hours (PSH) studies have been undertaken for all assessed living rooms with a window facing within 90° of due south, both annually (APSH) and in winter (WPSH). Results are provided in Section 7 of this report.

Overall, the results show that 129 (79%) of the 163 tested living areas meet or exceed the recommended sunlight levels throughout the year and 118 (72%) will be well sunlit during the winter months. These are considered good levels for a scheme of this size and nature.

More details on each of the detailed plots are provided below.

Building A

Building A is a courtyard shaped building located at the heart of the masterplan. The courtyard configuration facilitates the provision of a communal open space, but inevitably restricts the levels of light available to the inner facades, especially where balconies are also provided. Owing to the proposed urban grain, the external facades also have areas of reduced daylight availability, particularly on the lowest levels.

The daylight availability naturally increases towards the top part of the building and the results show that on the third floor, the majority of rooms see levels in line with or above guidance. The upper storeys are therefore expected to perform even better.

Some shortfalls are still seen on the third floor in combined LKDs, owing to their generous size and provision of balconies. Balconies inherently reduce the daylight and sunlight available to the windows set behind or beneath them, but they provide private open space for the enjoyment of future occupants. This trade off of different type of amenities (daylight and sunlight amenity v open space) is common within any contemporary development of this nature and is generally considered acceptable.

Building B

Building B is comprised of two linear blocks of terraced houses and three units have been assessed.

Good levels of daylight quantity are seen within the bedrooms assessed, with only one falling short marginally.

Despite good or very good levels of light available on the façade in most instances, this was not enough in some cases to light the generously-sized open plan LKDs to the recommended average. However, much greater levels than those reported as an average of the room will be seen in the living room located to the front of the room, closer to the fenestration. The kitchen, when in use, would rely more on supplementary artificial lighting. This is a common occurrence within contemporary accommodation where the access to natural light within the living areas is prioritised over that of kitchens.

Building C

This is a small linear block of flats, seeing good levels of light, overall.

All bedrooms assessed see ADF levels well above the minimum recommendation. Shortfalls are seen only on the lowest storeys and occur within the open plan LKDs, owing to their generous size and provision of balconies, as already discussed for other plots.

These rooms have very good levels sunlight and so will appear considerably brighter on sunny days. When looking at the performance within level three, all rooms see levels of daylight and sunlight in excess of the recommended minima.

Building D

This building is located at the edge of the masterplan, but in close proximity to Building A and E. Shortfalls are concentrated exclusively towards these blocks and can be attributed to the tight relationship with them. The performance within the rest of the rooms assessed is well above the minima recommended.

Building J3

Most rooms see good levels of daylight within this building, with isolated shortfalls seen within LKDs, owing to their generous size and/or provision balconies, as already discussed for other plots.

It should be noted that the majority of the rooms assessed not only meet, but exceed the recommended minima and will therefore offer very good levels of daylight amenity.

Sunlight levels are lower than recommended only in the rooms assessed on the lowest storey, as can be expected within urban contexts. On the second floor, sunlight levels are comfortably above the minima recommended.

Buildings KL and M

Finally, buildings KL and M are also courtyard -shaped, similarly to Building A, and so face similar challenges when considering the daylight and sunlight performance.

Owing to the more open nature of Building M and the greater separation distances between these two buildings and their neighbouring plots, levels of daylight have been found to be greater than those achieved within Building A, overall.

Where shortfalls are seen, these occur for the same reasons already explained, namely the generous size of the rooms, the provision of balconies, the relationship with the adjacent buildings or a combination of these.

In conclusion, the scheme generally offers good daylight and sunlight quality within its residential units, with the majority of rooms meeting or exceeding the recommendation.

Where shortfalls are seen this is due to other design considerations taking priority, such as maintaining the tight-knit character of the area and providing balconies directly off generously-sized LKDs.

OUTLINE COMPONENT

In order to ascertain the potential of the outline plots to provide adequate daylight and sunlight, Vertical Sky Component (VSC) and Annual Probable Sunlight Hours (APSH) assessments have been undertaken on the façades. The results are plotted in false-coloured scales and can be found in Section 8.

As the elevation details are still unknown at this stage, the analyses have considered flat façades without recesses or balconies. Once balconies are introduced, these will inevitably reduce the daylight and sunlight ingress into the rooms behind them (if recessed) or beneath them (if projecting). Whilst this is an accepted trade-off, the design will take this into account when positioning balconies and designing internal layouts and elevations.

The results of the assessments undertaken show that the outline plots enjoy the daylight and sunlight potential typical of any dense urban development. The outer façades generally enjoy very good daylight potential (shown as yellow in the diagrams). Therefore, standard design of internal layouts and elevations in these areas would generally lead to acceptable daylight levels indoors.

The daylight availability is lower on the bottom floors where two façades are in close proximity of one another, and in the inner corners of courtyards, as is typical of the proposed building typologies and density. In these areas, shown as orange to purple in the diagrams, special measures can be implemented at detailed design stage to ensure that the daylight ingress is maximised. Such measures may include generous fenestration, shallow layouts and the careful positioning of balconies and living areas.

Sunlight assessments have been undertaken on the elevations facing within 90° of due south, where the expectation of sunlight is greater. Very good levels of sunlight throughout the year can be seen on all assessed façades. The availability of winter sunlight is also very good on the outer elevations. Where blocks are in close proximity of one another, the lower floors receive lower levels of annual sunlight than recommended and little direct sunlight in winter, as is typical of urban environments where the urban grain restricts the sunlight availability on the lower floors.

Overall, the outline plots are considered to have the potential to offer good daylight and sunlight amenity for the enjoyment of future occupants.

4.4 CONCLUSIONS ON OVERSHADOWING

The BRE guidelines state that, in order for an outdoor space to be well sunlit throughout the year, at least half of its area should receive direct sunlight for two hours or more on 21st March. The proposed areas of public or communal outdoor amenity within the scheme have therefore been assessed against this criterion. In addition, in order to provide a better understanding of the sunlight availability throughout the year, sun exposure assessments have been undertaken for the equinox (21st March) and summer solstice (21st June). The results can be found within Section 9 of this report.

The main public realm area falls just short of recommendation, with 49% of the space receiving at least two hours of direct sunlight on 21st March and the 50% target being met just two days later, on 23rd March. The main square within the masterplan, located between blocks H and KL, receives good levels of sunlight throughout the year. The ground-level amenity areas within Blocks B and C exceed recommendation and will therefore be well sunlit throughout the year. The ground-level amenity areas will therefore offer good sunlight amenity for the enjoyment of future occupants.

The majority of podium-level amenity areas and roof terraces well exceed the BRE recommendation, offering excellent sunlight amenity throughout the year. Only three areas fall short of guidance; these are the courtyards of Block A, E/F and H (labelled as PG1, CY1 and CY2 respectively). Of these, the courtyards of Blocks A and H fall just short of recommendation, achieving 46% and 38% on 21st March and meeting the 50% target on 25th March and 1st April respectively. The courtyard of Block E/F receives little direct sunlight in winter and mid-season, but the majority of its area receives at least three hours of direct sunlight in the summer, with approximately half seeing in excess of six hours of sunlight on the summer solstice. This area will therefore also offer good levels of sunlight in the summer, when people are most likely to spend time outdoors.

In conclusion, the ground-level public realm offers good levels of sunlight throughout the year, the majority of courtyards and roof terraces well exceed guidance and the few falling short of recommendation either do so just marginally or enjoy good sunlight levels in the summer.

Overall therefore, the proposed masterplan offers very good sunlight amenity within its public or communal outdoor areas.

6 SITE OVERVIEW

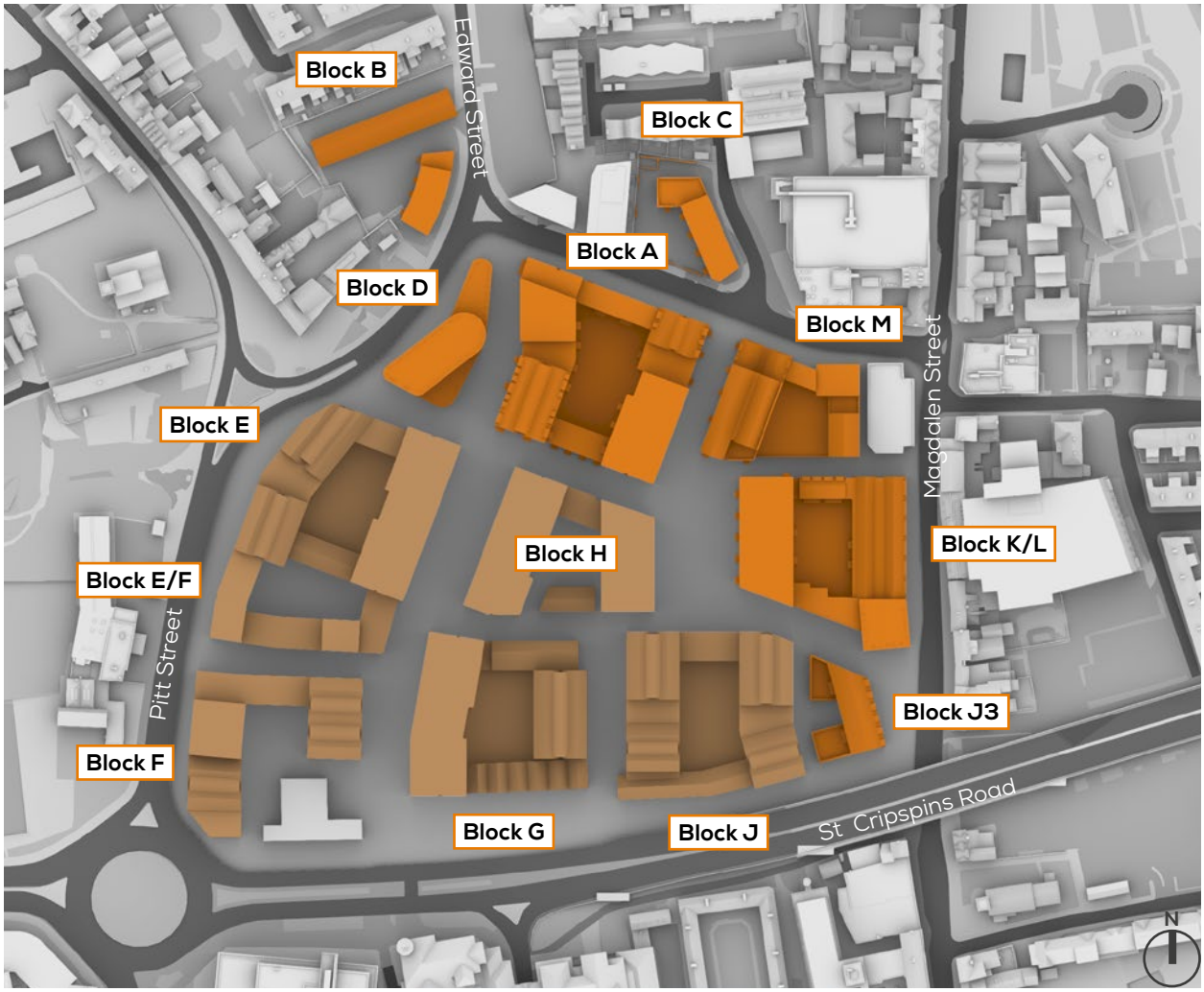


Fig. 01: Top view

Detailed blocks (assessed for internal daylight and sunlight)

Outline blocks (assessed for daylight and sunlight potential)

Fig. 02: Perspective view

Detailed blocks (assessed for internal daylight and sunlight)
Outline blocks (assessed for daylight and sunlight potential)

7 INTERNAL DAYLIGHT AND SUNLIGHT ASSESSMENTS

KEY TO UNDERSTANDING THE TABLES - DAYLIGHT

DAYLIGHT QUANTUM

Average Daylight Factor (ADF)

Refers to the average percentage of daylight flux in a room against an external unobstructed plane.

BRE recommends ADF levels of 2% for rooms with kitchens (including LKDs and studios with kitchens), 1.5% for living rooms and studies, and 1% for bedrooms.

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
Building C - SIXTH FLOOR						
686	L/K/D	2.8	99	N/A		
687	L/K/D	2.5	100	N/A	78	27
688	Bedroom	1.1	90	MET		
689	Bedroom	1.4	87	MET		
690	Bedroom	1.4	89	MET		
691	Bedroom	2	85	N/A		
692	Bedroom	1.6	82	MET		
693	Bedroom	1.4	95	MET		
694	Bedroom	1.6	98	MET		
695	Bedroom	2.2	93	N/A		
696	Living Room	2.6	100	N/A	56	24
697	Bedroom	2.5	100	N/A		
698	Bedroom	2.3	97	MET		
699	L/K/D	1.3	95	MET	57	28
700	Living Room	1.8	96	N/A	64	27
701	Bedroom	1.4	98	MET		
702	Living Room	1.2	96	MET	39	14

DAYLIGHT DISTRIBUTION

No-SkyLine (NSL)

Refers to the percentage of the room with a view of the sky from a working plane at desk hight.

BRE recommends the NSL to be at least 80% for the room to guarantee satisfactory daylight uniformity.

Room Depth Criterion (RDC)

Defines adequate room proportions that enable good distribution of light. It applies to rooms lit by windows in one wall only.

MET : The room meets the Room Depth criterion

NOT MET: The room does not meet BRE's RDC

N/A (Not Applicable): The room is not lit by windows in one wall only, and cannot be assessed by BRE's RDC

KEY TO UNDERSTANDING THE TABLES - SUNLIGHT

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
Building C - SIXTH FLOOR						
686	L/K/D	2.8	99	N/A		
687	L/K/D	2.5	100	N/A	78	27
688	Bedroom	1.1	90	MET		
689	Bedroom	1.4	87	MET		
690	Bedroom	1.4	89	MET		
691	Bedroom	2	85	N/A		
692	Bedroom	1.6	82	MET		
693	Bedroom	1.4	95	MET		
694	Bedroom	1.6	98	MET		
695	Bedroom	2.2	93	N/A		
696	Living Room	2.6	100	N/A	56	24
697	Bedroom	2.5	100	N/A		
698	Bedroom	2.3	97	MET		
699	L/K/D	1.3	95	MET	57	28
700	Living Room	1.8	96	N/A	64	27
701	Bedroom	1.4	98	MET		
702	Living Room	1.2	96	MET	39	14

SUNLIGHT QUANTUM

Probable Sunlight Hours (PSH)

Refers to the percentage of total probable hours during a year in which a room receives direct sunlight (%).

BRE states that sunlight is most appreciated in living areas and the greatest expectation of sunlight is within south facing rooms. PSH assessments therefore consider all of the living rooms with a main window facing within 90 degrees of due south.

Annual Probable Sunlight Hours (APSH)

BRE recommends at least 25% of Annual Probable Sunlight Hours for rooms where sunlight is expected.

Winter Probable Sunlight Hours (WPSH)

BRE recommends at least 5% of Winter Probable Sunlight Hours for rooms where sunlight is expected.

Block A

Ground Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK A - LEVEL 00						
1	Bedroom	0.6	31	MET		
2	Bedroom	0.7	24	MET		
3	L/K/D	0.9	68	MET		
4	Bedroom	0.7	43	MET		
5	Bedroom	0.8	61	MET		
6	Bedroom	1	49	MET		
7	L/K/D	0.4	38	MET		
8	Living Room	0.8	58	N/A	7	2
9	Bedroom	0.9	51	MET		
10	Bedroom	0.8	80	MET		
11	L/K/D	2	93	N/A		
12	Bedroom	0.9	39	MET		

Table 02: Assessment Data

Fig. 03: Floor Plan

Block A

First Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK A - LEVEL 01						
13	Bedroom	1.6	97	MET		
14	L/K/D	2	98	N/A	26	7
15	Bedroom	1.1	58	MET		
16	Bedroom	1	55	MET		
17	L/K/D	0.8	39	MET		
18	Bedroom	1	32	MET		
19	Bedroom	0.9	18	MET		
20	L/K/D	1	23	MET	8	0
21	Bedroom	1	32	MET		
22	L/K/D	0.7	30	MET		
23	Bedroom	1.4	41	MET		
24	Living Room	1.9	59	MET	12	3
25	Bedroom	1.5	70	MET		
26	Bedroom	0.9	32	MET		
27	Bedroom	1.1	52	MET		
28	L/K/D	1.2	34	MET	20	1
29	Bedroom	1.3	46	MET		
30	Living Room	1.2	36	N/A	26	3
31	Bedroom	1.1	38	MET		
32	Living Room	0.9	30	N/A		
33	Bedroom	0.7	12	MET		
34	Bedroom	0.6	5	MET		
35	Living Room	0.9	41	N/A	12	3
36	Bedroom	1.1	41	MET		
37	Bedroom	0.8	79	MET		
38	L/K/D	2.6	98	N/A		
39	Bedroom	1.7	78	MET		
40	Bedroom	1.7	89	MET		
41	Bedroom	1.4	82	MET		
42	L/K/D	0.7	33	MET	31	6
43	Bedroom	2.4	96	MET		
44	Bedroom	1.3	69	MET		
45	L/K/D	2.8	97	N/A	30	7
46	Kitchen	3.5	96	MET		
47	Living Room	1.8	80	MET	16	7
48	Bedroom	1.6	89	MET		
49	L/K/D	1.4	52	MET	25	3
50	Bedroom	1.9	85	MET		
51	Bedroom	2.7	99	MET		
52	Bedroom	2.2	91	MET		
53	Bedroom	2.6	91	MET		

Table 03: Assessment Data

Fig. 04: Floor Plan

Block A

First Floor - continued

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
54	L/K/D	2.2	89	N/A	24	2
55	Bedroom	1.1	47	MET		
56	L/K/D	0.7	24	MET	15	4
57	Bedroom	0.9	20	MET		
58	Bedroom	1.3	45	MET		
59	L/K/D	1	23	MET		
60	Bedroom	0.8	20	MET		
61	L/K/D	0.5	14	MET	6	2
62	Bedroom	1.6	53	MET		
63	L/K/D	1.1	26	NOT MET		
64	Bedroom	0.8	18	MET		
65	Bedroom	0.8	15	MET		
66	Bedroom	1.3	28	MET		
67	L/K/D	1.3	32	NOT MET		
68	Bedroom	0.8	13	MET		
69	Bedroom	1.3	35	MET		
70	L/K/D	0.9	20	MET		
71	Living Room	1.1	39	N/A	30	10
72	Bedroom	0.6	28	MET		
73	L/K/D	0.7	14	MET		
74	Bedroom	0.9	25	MET		
75	Bedroom	0.7	74	MET		
76	L/K/D	1.1	65	N/A	36	9
77	L/K/D	1	66	N/A	32	9
78	Bedroom	1.4	79	MET		
79	L/K/D	0.4	17	NOT MET	26	3
80	Bedroom	0.9	39	MET		
81	Bedroom	0.4	14	MET		
82	Living Room	1.2	74	MET	22	0
83	Kitchen	1.3	62	MET		
84	Living Room	1.2	72	MET	28	0
85	Kitchen	1.6	68	MET		
86	Living Room	1.1	67	MET	27	0
87	Kitchen	1.6	70	MET		
88	Living Room	1	59	MET	29	2
89	Kitchen	1.4	63	MET		
90	Bedroom	0.4	20	MET		
91	Bedroom	0.5	44	MET		
92	L/K/D	0.6	82	NOT MET	24	4

Table 04: Assessment Data

Fig. 05: Floor Plan

Block A

Second Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK A - LEVEL 02						
93	Bedroom	1.9	98	MET		
94	L/K/D	2.5	99	N/A	31	8
95	Bedroom	1.3	64	MET		
96	Bedroom	1.2	59	MET		
97	L/K/D	0.9	41	MET		
98	Bedroom	1.1	37	MET		
99	Bedroom	1	24	MET		
100	L/K/D	1	30	MET	18	5
101	Bedroom	1.1	36	MET		
102	L/K/D	0.9	37	MET		
103	Bedroom	1.5	47	MET		
104	Living Room	1.9	81	MET	22	7
105	Bedroom	1.7	94	MET		
106	Bedroom	1.1	42	MET		
107	Bedroom	1.2	59	MET		
108	L/K/D	1.2	64	MET	26	4
109	Bedroom	1.5	75	MET		
110	Bedroom	1.3	48	MET		
111	Living Room	1.1	34	N/A		
112	Living Room	1.2	59	MET	28	3
113	Bedroom	1.7	64	MET		
114	Bedroom	0.9	31	MET		
115	Bedroom	0.9	27	MET		
116	Living Room	1.2	44	N/A	16	3
117	Bedroom	1.4	52	MET		
118	Bedroom	0.9	81	MET		
119	L/K/D	3	99	N/A		
120	Bedroom	2	96	MET		
121	Bedroom	2	96	MET		
122	Bedroom	1.7	94	MET		
123	L/K/D	0.7	38	MET	30	8
124	Bedroom	2.7	96	MET		
125	Bedroom	1.4	71	MET		
126	L/K/D	3.1	100	N/A	38	12
127	Kitchen	3.7	99	MET		
128	Living Room	1.8	84	MET	18	8
129	Bedroom	1.8	92	MET		
130	L/K/D	1.3	57	MET	31	5
131	Bedroom	2	85	MET		
132	Bedroom	2.9	99	MET		
133	Bedroom	2.4	92	MET		

Table 05: Assessment Data

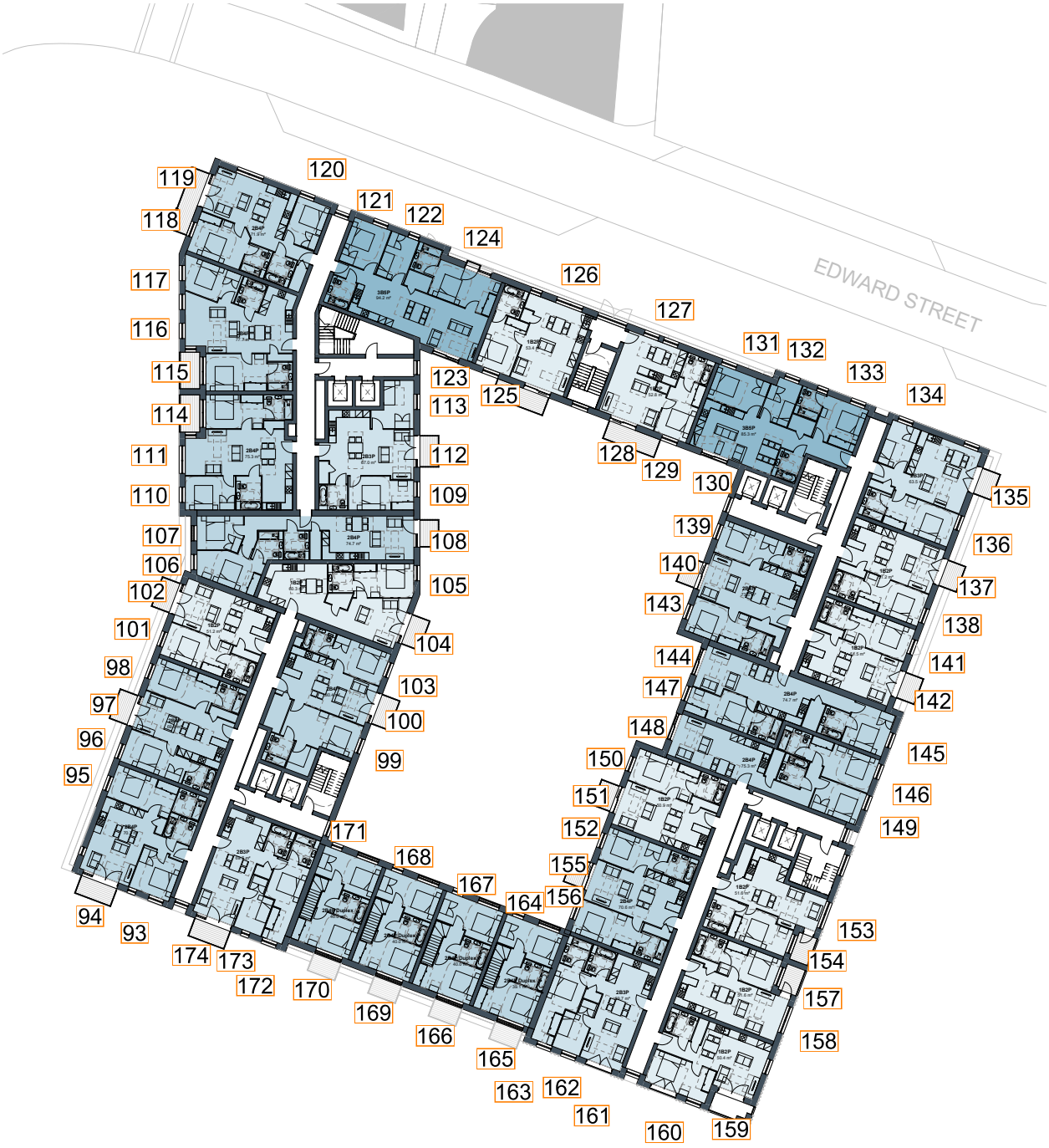


Fig. 06: Floor Plan

Block A

Second Floor - continued

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
134	Bedroom	2.8	98	MET		
135	L/K/D	2.3	89	N/A	30	5
136	Bedroom	1.3	54	MET		
137	L/K/D	0.9	30	MET	20	5
138	Bedroom	1.1	27	MET		
139	Bedroom	1.5	69	MET		
140	L/K/D	1	35	MET		
141	Bedroom	1	27	MET		
142	L/K/D	0.6	19	MET	7	2
143	Bedroom	1.8	68	MET		
144	L/K/D	1.1	35	NOT MET		
145	Bedroom	1	24	MET		
146	Bedroom	0.9	21	MET		
147	Bedroom	1.4	41	MET		
148	L/K/D	1.3	42	NOT MET		
149	Bedroom	1	20	MET		
150	Bedroom	1.5	47	MET		
151	L/K/D	1	31	MET		
152	Bedroom	1.3	39	MET		
153	Living Room	1.4	42	N/A	31	11
154	Bedroom	0.7	49	MET		
155	L/K/D	0.8	22	MET		
156	Bedroom	1	29	MET		
157	Bedroom	0.8	80	MET		
158	L/K/D	1.4	67	N/A	41	10
159	L/K/D	1.2	75	N/A	37	11
160	Bedroom	1.6	88	MET		
161	L/K/D	0.5	28	NOT MET	34	3
162	Bedroom	1.2	69	MET		
163	Bedroom	0.5	25	MET		
164	Bedroom	2.6	92	MET		
165	Bedroom	1.6	85	MET		
166	Bedroom	1.5	86	MET		
167	Bedroom	3.3	94	MET		
168	Bedroom	3.3	94	MET		
169	Bedroom	1.3	78	MET		
170	Bedroom	1.2	73	MET		
171	Bedroom	3	93	MET		
172	Bedroom	0.5	21	MET		
173	Bedroom	0.6	46	MET		
174	L/K/D	0.8	84	NOT MET	29	7

Table 06: Assessment Data

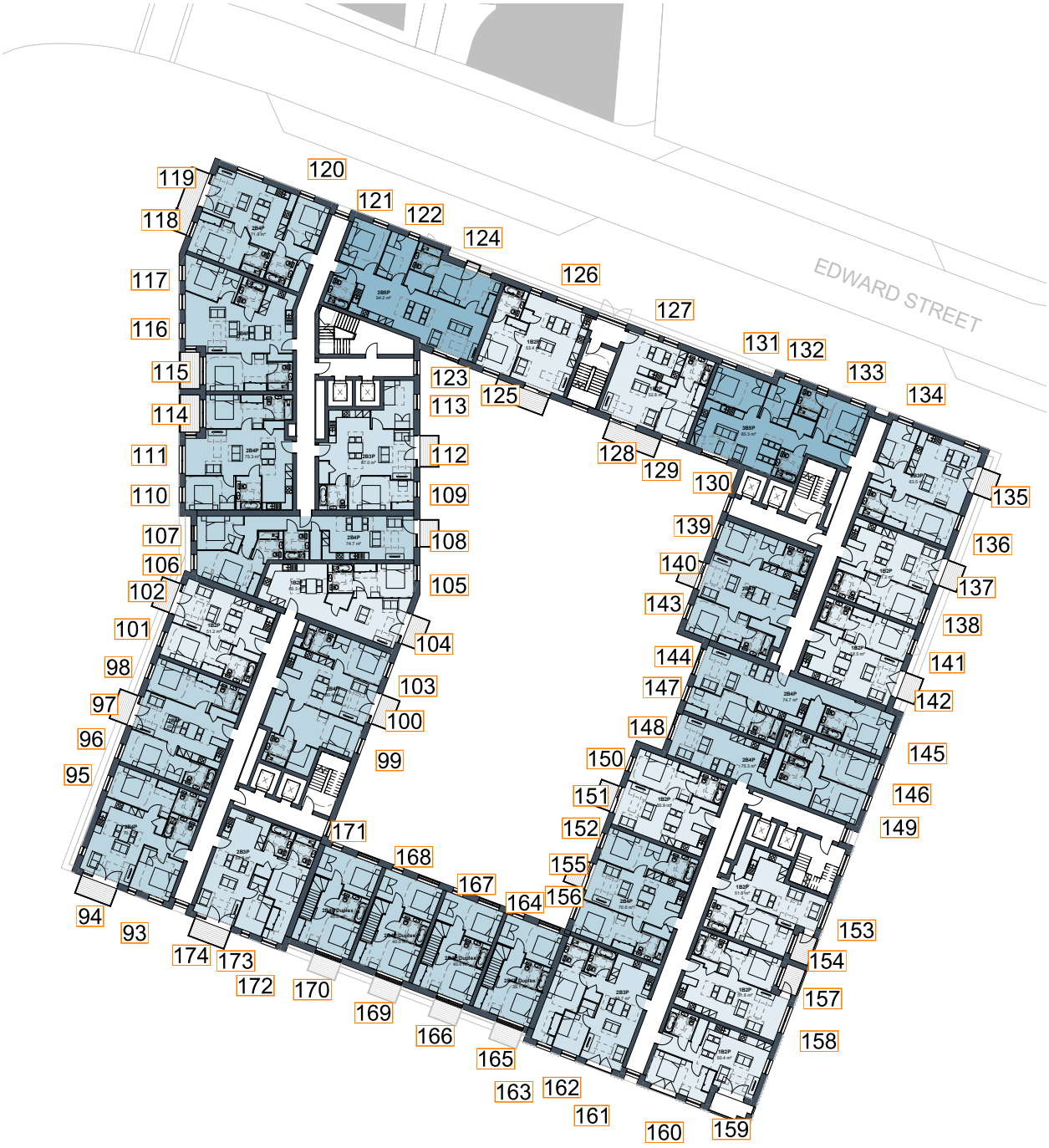


Fig. 07: Floor Plan

Block A

Third Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK A - LEVEL 03						
175	Bedroom	1.4	65	MET		
176	L/K/D	3	100	N/A	46	9
177	Bedroom	1.5	73	MET		
178	Bedroom	1.4	68	MET		
179	L/K/D	1.3	45	MET		
180	Bedroom	1.3	47	MET		
181	Bedroom	1.3	45	MET		
182	Bedroom	1.2	32	MET		
183	L/K/D	1.3	33	MET	34	8
184	L/K/D	1.2	49	MET		
185	Bedroom	1.3	51	MET		
186	Bedroom	1.7	55	MET		
187	Living Room	2.4	86	MET	36	8
188	Bedroom	1.9	98	MET		
189	L/K/D	1.6	97	MET	34	5
190	Bedroom	1.5	67	MET		
191	Bedroom	1.5	57	MET		
192	Living Room	1.3	45	N/A		
193	Bedroom	1.7	96	MET		
194	Living Room	1.7	98	MET	36	6
195	Bedroom	2	82	MET		
196	Bedroom	1	80	MET		
197	Bedroom	1	77	MET		
198	Living Room	1.5	60	N/A	23	4
199	Bedroom	1.9	94	MET		
200	Bedroom	1.3	95	MET		
201	L/K/D	3.7	100	N/A		
202	Bedroom	2.3	96	MET		
203	Bedroom	2.3	96	MET		
204	Bedroom	1.9	94	MET		
205	L/K/D	0.8	45	MET	33	9
206	Bedroom	3	96	MET		
207	Bedroom	2.1	80	MET		
208	L/K/D	3.6	100	N/A	61	15
209	L/K/D	3.3	99	N/A	53	11
210	Bedroom	2.7	97	MET		
211	L/K/D	1.7	68	MET	41	7
212	Bedroom	2.1	85	MET		
213	Bedroom	3.1	99	MET		
214	Bedroom	2.6	92	MET		
215	Bedroom	3.1	98	MET		

Table 07: Assessment Data

Fig. 08: Floor Plan

Block A

Third Floor - continued

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
216	L/K/D	3	93	N/A	42	6
217	Bedroom	1.4	73	MET		
218	L/K/D	1.4	46	MET	34	6
219	Bedroom	1.2	34	MET		
220	Bedroom	1.7	83	MET		
221	L/K/D	1.5	60	MET		
222	Bedroom	1.2	33	MET		
223	L/K/D	1.1	23	MET	18	2
224	Bedroom	2	93	MET		
225	L/K/D	1.4	51	NOT MET		
226	Bedroom	1.2	33	MET		
227	Bedroom	1.1	30	MET		
228	Bedroom	1.6	71	MET		
229	L/K/D	1.6	62	NOT MET		
230	Bedroom	1.1	29	MET		
231	Bedroom	1.6	69	MET		
232	L/K/D	1.2	45	MET		
233	Living Room	1.6	49	N/A	37	15
234	Bedroom	0.8	62	MET		
235	Bedroom	1.4	47	MET		
236	L/K/D	1	33	MET		
237	Bedroom	1.2	37	MET		
238	Bedroom	0.8	83	MET		
239	L/K/D	1.4	71	N/A	45	13
240	L/K/D	1.4	85	N/A	41	12
241	Bedroom	2	99	MET		
242	L/K/D	0.7	62	NOT MET	44	5
243	Bedroom	1.6	76	MET		
244	Bedroom	0.7	64	MET		
245	Studio	2.3	99	N/A	46	10
246	Studio	2.2	97	N/A	42	10
247	Studio	2.1	82	N/A	45	8
248	Studio	1.8	80	N/A	36	4
249	Bedroom	0.6	21	MET		
250	Bedroom	0.7	49	MET		
251	L/K/D	1	87	NOT MET	43	9

Table 08: Assessment Data

Fig. 09: Floor Plan

Block B

Ground Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK B - LEVEL 00						
252	Living Room	2.3	77	MET		
253	Kitchen	1.8	39	MET		
254	Living Room	2.2	71	MET		
255	Kitchen	2.2	89	MET		
256	L/K/D	1.3	96	MET		
257	Bedroom	2.3	95	MET		

Table 09: Assessment Data

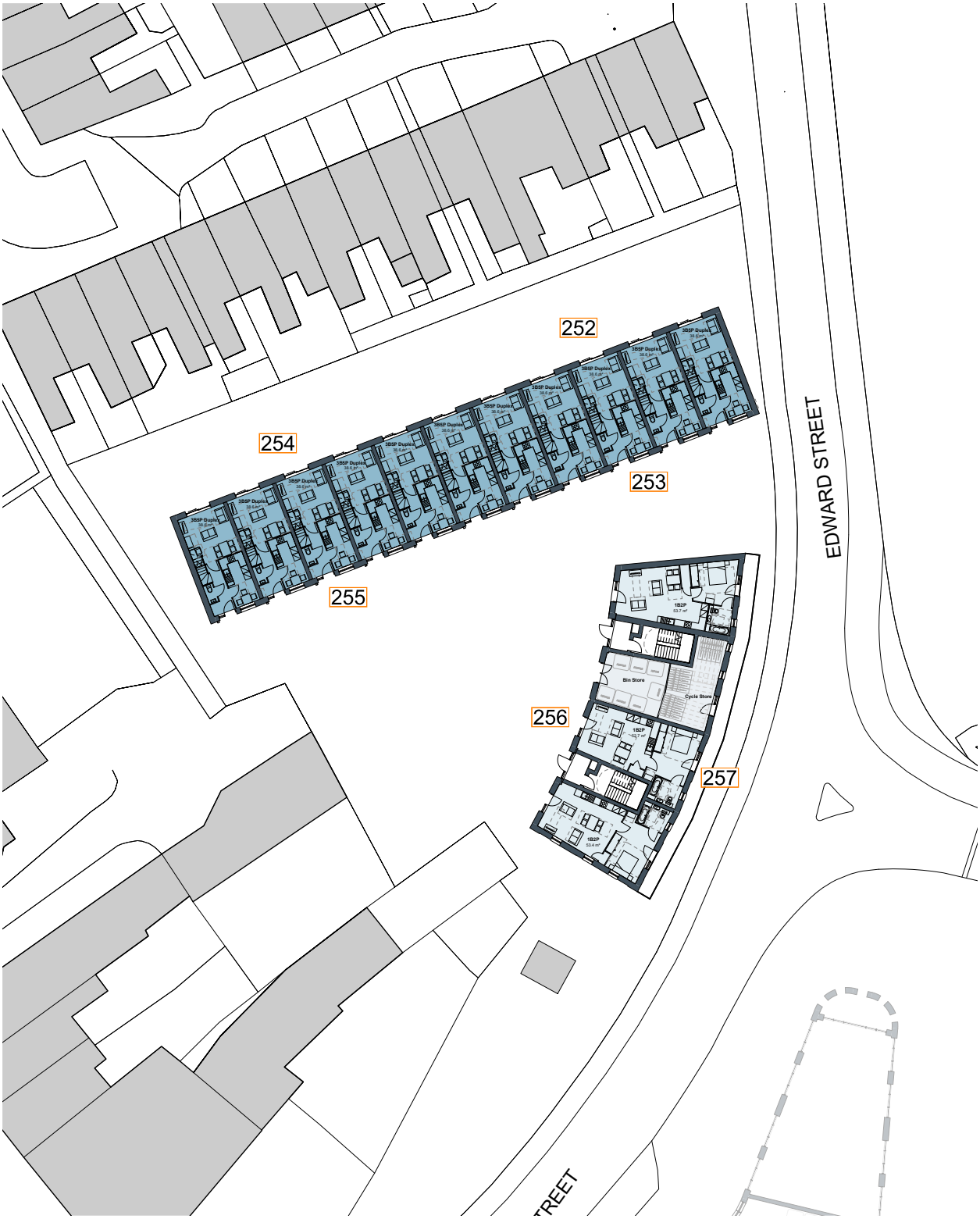


Fig. 10: Floor Plan

Block B

First Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK B - LEVEL 01						
258	Bedroom	2	94	MET		
259	Bedroom	1.9	72	MET		
260	Bedroom	1.9	94	MET		
261	Bedroom	2.1	78	MET		
262	L/K/D	1.4	99	MET		
263	Bedroom	2.5	96	MET		

Table 10: Assessment Data

Fig. 11: Floor Plan

Block B

Second Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK B - LEVEL 02						
264	Bedroom	0.9	33	MET		
265	Bedroom	1	60	MET		
266	L/K/D	1.5	99	MET		
267	Bedroom	2.6	96	MET		

Table 11: Assessment Data

Fig. 12: Floor Plan

Block C

Ground Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK C - LEVEL 00						
268	L/K/D	0.7	41	MET	39	10
269	Bedroom	2.4	97	MET		
270	Bedroom	2.1	94	N/A		
271	L/K/D	1.5	89	N/A		
272	L/K/D	0.6	33	MET	26	6
273	Bedroom	1.6	90	MET		
274	L/K/D	0.7	55	MET	21	0
275	Bedroom	1.8	90	MET		
276	Bedroom	3	96	N/A		
277	L/K/D	2.2	97	N/A	65	11

Table 12: Assessment Data

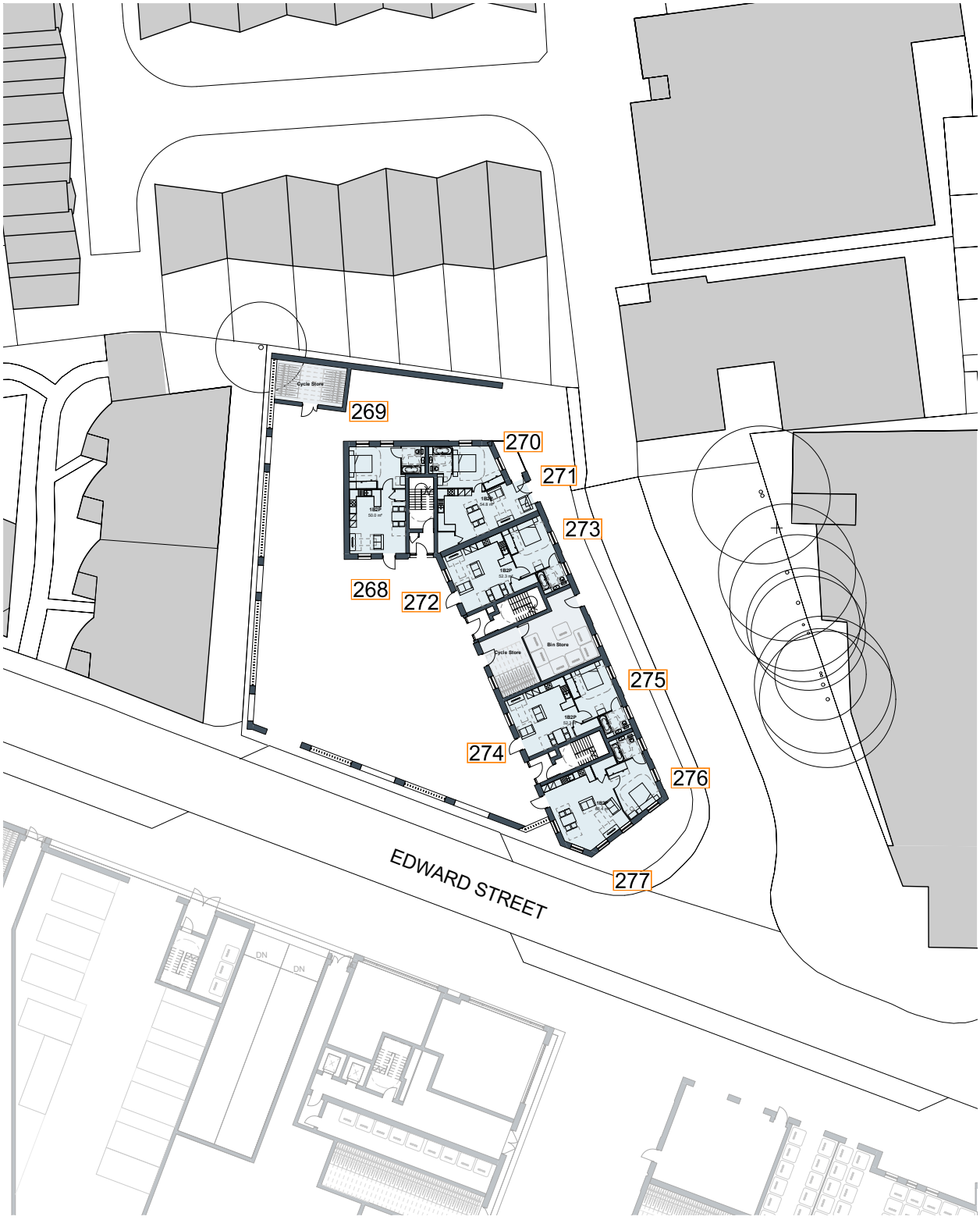


Fig. 13: Floor Plan

Block C

First Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK C - LEVEL 01						
278	L/K/D	1.5	87	MET	45	14
279	Bedroom	3.5	97	MET		
280	Bedroom	2.6	95	N/A		
281	L/K/D	2.2	99	N/A		
282	L/K/D	1.3	93	MET	37	8
283	Bedroom	1.9	93	MET		
284	Bedroom	1.9	90	MET		
285	L/K/D	1.5	92	MET	39	6
286	L/K/D	1.5	88	MET	33	3
287	Bedroom	1.9	90	MET		
288	Bedroom	3.4	97	N/A		
289	L/K/D	3.2	100	N/A	79	14

Table 13: Assessment Data

Fig. 14: Floor Plan

Block C

Second Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK C - LEVEL 02						
290	L/K/D	2	99	MET	61	21
291	Bedroom	3.8	97	MET		
292	Bedroom	2.8	95	N/A		
293	L/K/D	2	99	N/A		
294	L/K/D	1.6	97	MET	44	10
295	Bedroom	2	93	MET		
296	Bedroom	2	90	MET		
297	L/K/D	1.7	97	MET	43	8
298	L/K/D	1.7	96	MET	43	8
299	Bedroom	2	90	MET		
300	Bedroom	3.5	98	N/A		
301	L/K/D	3.6	100	N/A	88	20

Table 14: Assessment Data

Fig. 15: Floor Plan

Block C

Third Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK C - LEVEL 03						
302	L/K/D	2.1	97	MET	47	12
303	Bedroom	2	93	MET		
304	Bedroom	2	90	MET		
305	L/K/D	2.1	97	MET	47	12
306	L/K/D	2.1	98	MET	47	12
307	Bedroom	2.1	90	MET		
308	Bedroom	3.7	100	N/A		
309	L/K/D	4.2	100	N/A	93	24

Table 15: Assessment Data

Fig. 16: Floor Plan

Block D

First Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK D - LEVEL 01						
310	Bedroom	4.7	100	N/A		
311	Bedroom	2.9	99	N/A		
312	L/K/D	1.7	95	N/A	27	3
313	Bedroom	0.5	13	MET		
314	Living Room	0.5	13	MET	4	0
315	Bedroom	0.5	15	MET		
316	Bedroom	0.4	15	MET		
317	L/K/D	0.4	14	N/A	3	0
318	Bedroom	0.8	29	MET		
319	Bedroom	1.4	97	MET		
320	L/K/D	2.2	98	MET		
321	Bedroom	3.4	98	MET		
322	Bedroom	1.4	96	MET		
323	L/K/D	3.9	99	N/A	44	4
324	Bedroom	0.9	53	MET		
325	Bedroom	1.4	69	MET		
326	L/K/D	0.7	38	MET	25	1

Table 16: Assessment Data

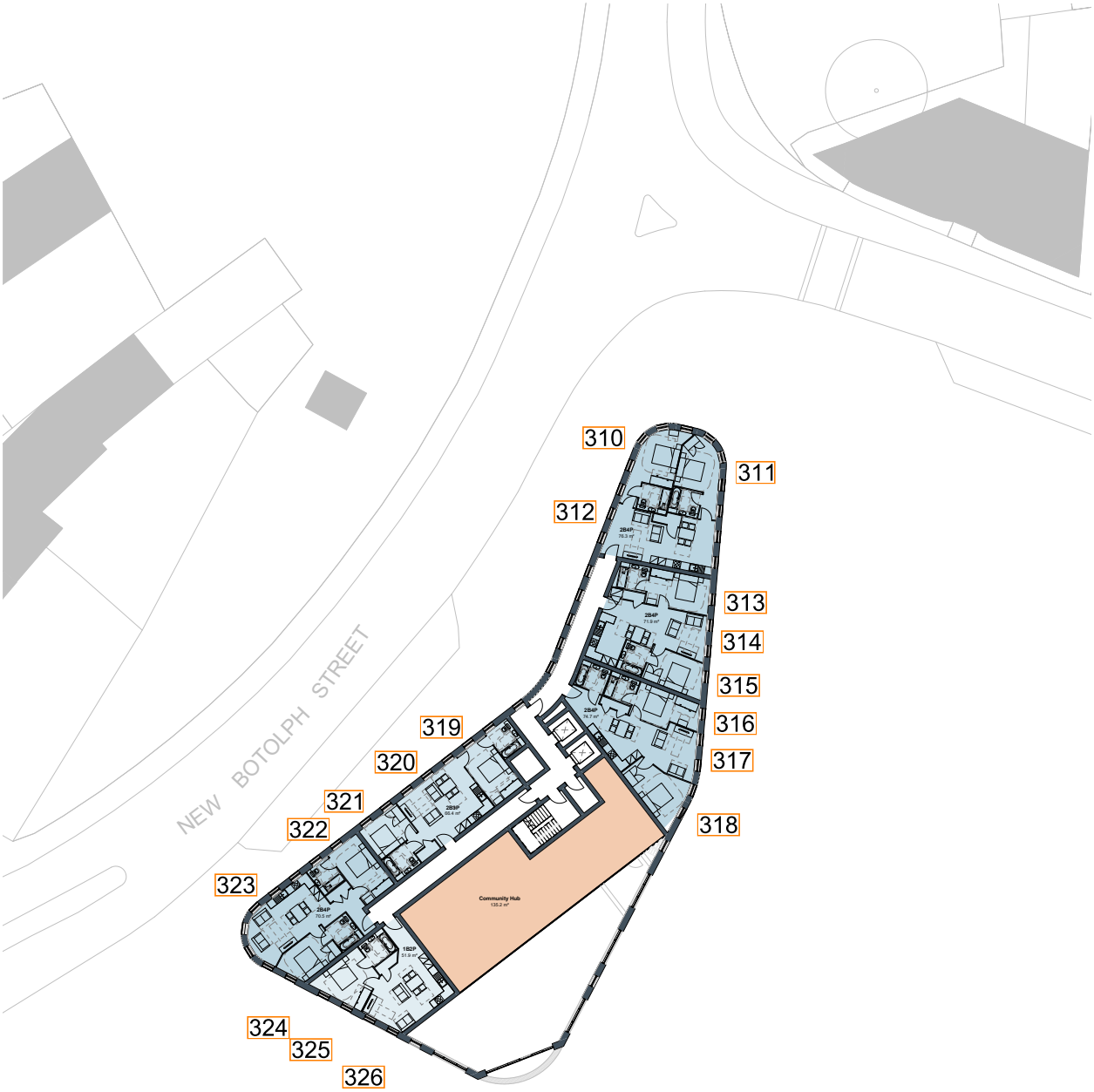


Fig. 17: Floor Plan

Block D

Second Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK D - LEVEL 02						
327	Bedroom	4.6	98	N/A		
328	Bedroom	3	98	N/A		
329	L/K/D	1.8	95	N/A	24	2
330	Bedroom	0.5	18	MET		
331	Living Room	0.6	18	MET	6	0
332	Bedroom	0.5	22	MET		
333	Bedroom	0.5	24	MET		
334	L/K/D	0.5	24	MET	10	0
335	Bedroom	1	43	MET		
336	Bedroom	0.7	22	MET		
337	L/K/D	1.2	83	MET	29	9
338	Bedroom	1	72	MET		
339	L/K/D	1	66	MET	32	8
340	Bedroom	1	82	MET		
341	L/K/D	1.8	97	N/A	53	6
342	Bedroom	1.6	96	MET		
343	Bedroom	1	89	MET		
344	L/K/D	3.8	99	N/A	50	9
345	Bedroom	1.4	96	MET		
346	Bedroom	3.3	97	MET		
347	L/K/D	2.2	98	MET		
348	Bedroom	1.4	96	MET		

Table 17: Assessment Data

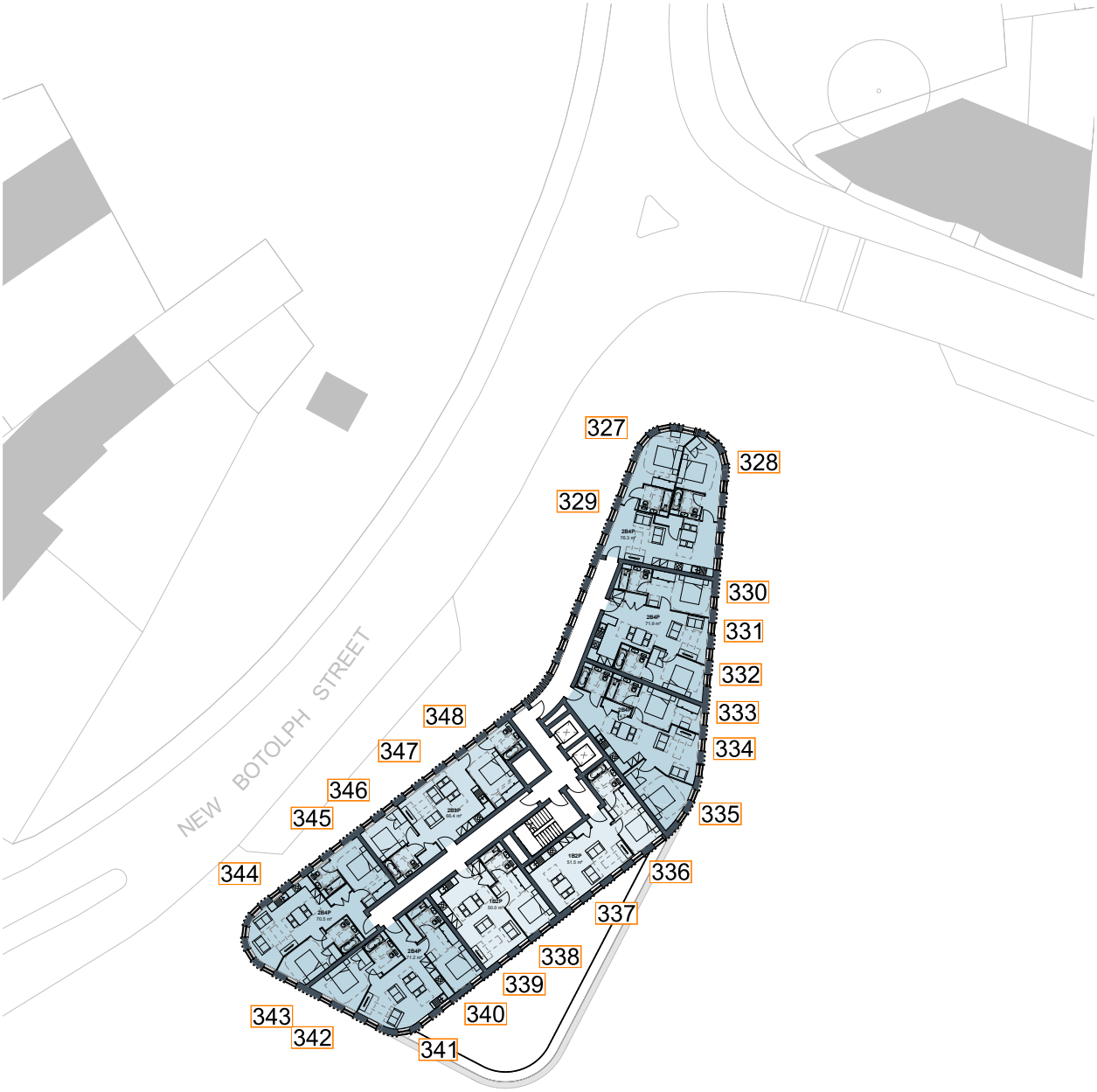


Fig. 18: Floor Plan

Block D

Third Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK D - LEVEL 03						
349	Bedroom	4.7	98	N/A		
350	Bedroom	3.3	98	N/A		
351	L/K/D	1.9	96	N/A	28	2
352	Bedroom	0.7	31	MET		
353	Living Room	0.8	26	MET	11	0
354	Bedroom	0.7	34	MET		
355	Bedroom	0.6	45	MET		
356	L/K/D	0.6	41	MET	14	0
357	Bedroom	1.2	73	MET		
358	Bedroom	0.8	29	MET		
359	L/K/D	1.3	86	MET	36	12
360	Bedroom	1	78	MET		
361	L/K/D	1	87	MET	41	12
362	Bedroom	1	87	MET		
363	L/K/D	2	99	N/A	65	11
364	Bedroom	1.9	96	MET		
365	Bedroom	1.2	97	MET		
366	L/K/D	3.9	100	N/A	55	14
367	Bedroom	1.4	96	MET		
368	Bedroom	3.3	97	MET		
369	L/K/D	2.2	98	MET		
370	Bedroom	1.4	96	MET		

Table 18: Assessment Data

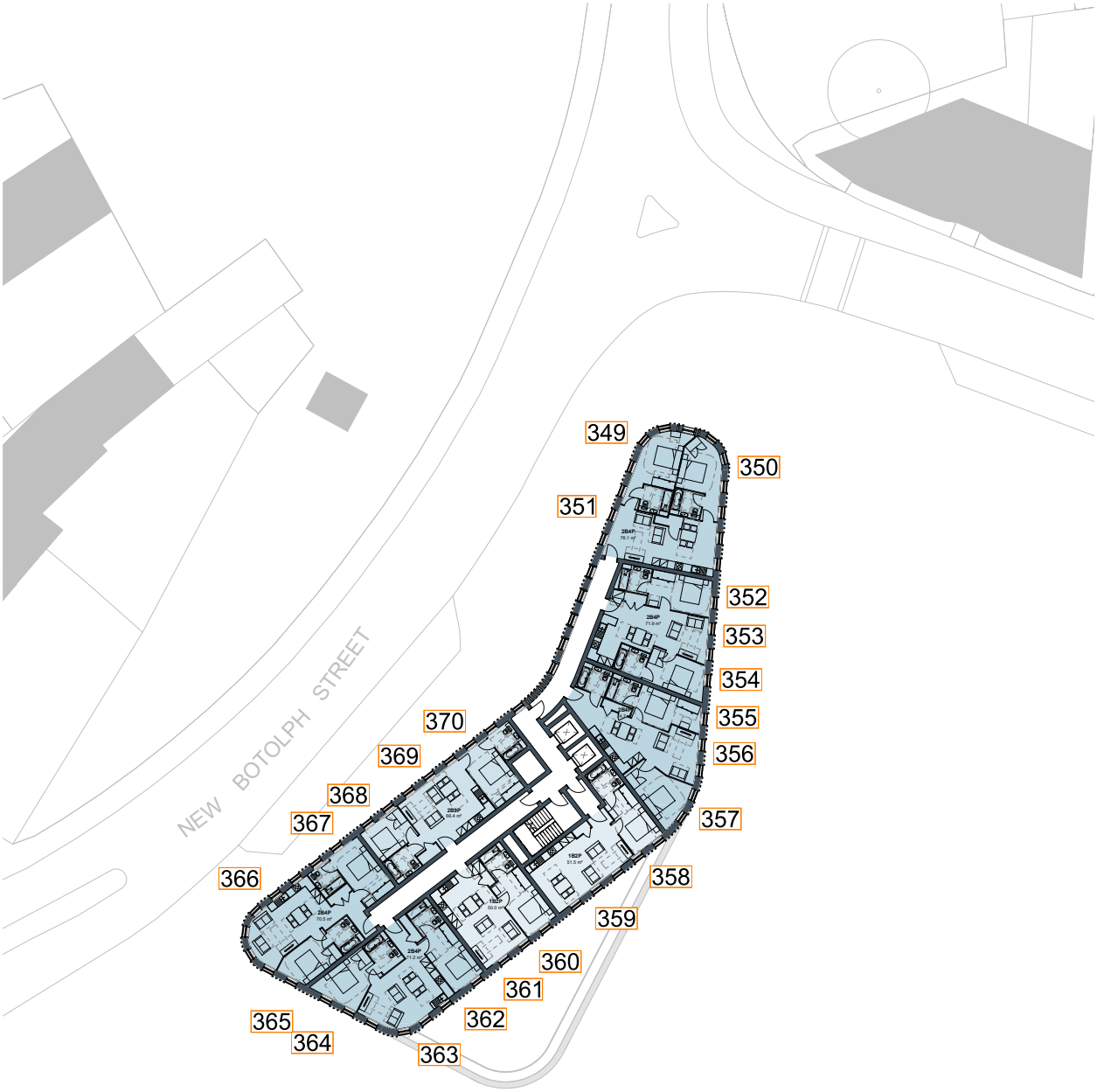


Fig. 19: Floor Plan

Block J3

First Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK J3 - LEVEL 01						
371	Bedroom	2.9	71	N/A		
372	L/K/D	1	15	MET	10	4
373	Bedroom	3.4	100	N/A		
374	L/K/D	2.2	99	MET		
375	Bedroom	3.2	99	MET		
376	L/K/D	2.3	99	MET		
377	Bedroom	3.2	99	MET		
378	Bedroom	3.4	98	MET		
379	Bedroom	3.3	92	N/A		
380	Living Room	2	67	MET	14	7

Table 19: Assessment Data

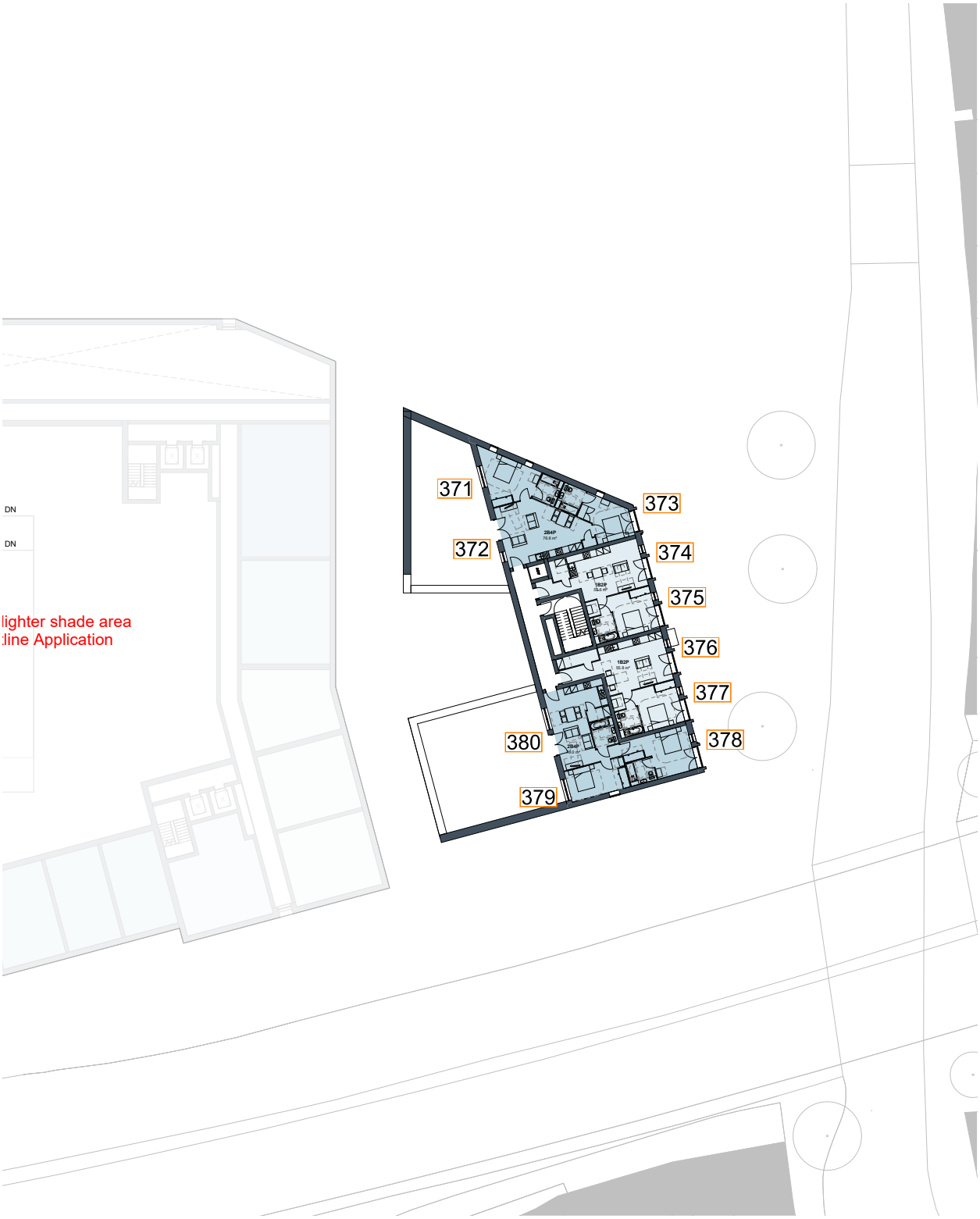


Fig. 20: Floor Plan

Block J3

Second Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK J3 - LEVEL 02						
381	Bedroom	3	92	N/A		
382	L/K/D	1.4	36	MET	30	7
383	Bedroom	3.1	100	N/A		
384	L/K/D	1.9	98	MET		
385	Bedroom	2.7	96	MET		
386	L/K/D	1.9	97	MET		
387	Bedroom	2.7	96	MET		
388	Bedroom	2.7	95	MET		
389	Bedroom	3.7	97	N/A		
390	Living Room	3.2	89	MET	33	12

Table 20: Assessment Data

Fig. 21: Floor Plan

Block KL

First Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK KL - LEVEL 01						
391	Bedroom	1.9	94	MET		
392	Bedroom	1.8	84	MET		
393	Bedroom	1.5	81	MET		
394	Bedroom	1.3	60	MET		
395	L/K/D	1.9	74	N/A	33	8
396	Bedroom	1.7	83	MET		
397	L/K/D	1.3	51	MET		
398	Bedroom	1.8	77	MET		
399	L/K/D	1.3	52	MET	33	8
400	Bedroom	1.8	78	MET		
401	L/K/D	1.4	55	MET	33	8
402	Bedroom	1.9	80	MET		
403	L/K/D	1.4	66	MET	35	9
404	Bedroom	2.3	95	MET		
405	L/K/D	1.5	84	MET	36	9
406	Bedroom	2	99	MET		

Table 21: Assessment Data

Fig. 22: Floor Plan

Block KL

Second Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK KL - LEVEL 02						
407	L/K/D	2	99	N/A	50	15
408	L/K/D	2.7	99	N/A	53	17
409	L/K/D	2.8	98	N/A	49	16
410	L/K/D	2.6	99	N/A	43	14
411	Bedroom	0.4	60	MET		
412	L/K/D	0.8	74	N/A	41	8
413	Bedroom	1.5	65	MET		
414	L/K/D	2	95	N/A	46	7
415	Bedroom	3.2	79	MET		
416	Bedroom	2.4	99	MET		
417	Bedroom	1.8	71	MET		
418	L/K/D	0.9	44	MET	25	4
419	L/K/D	1.5	64	MET	28	1
420	Bedroom	2.6	99	MET		
421	Bedroom	1.9	55	MET		
422	L/K/D	1	53	MET	26	5
423	Bedroom	2.5	98	MET		
424	L/K/D	1.6	67	MET	33	6
425	Bedroom	2.3	84	MET		
426	L/K/D	1	73	MET	26	4
427	Bedroom	2.5	92	MET		
428	Bedroom	2.3	91	MET		
429	Bedroom	1.9	94	MET		
430	L/K/D	1	68	MET		
431	Bedroom	1.6	79	MET		
432	Bedroom	2.1	64	MET		
433	Bedroom	2.2	80	MET		
434	L/K/D	1.7	95	N/A	31	12
435	Bedroom	2.4	93	MET		
436	Bedroom	2.4	83	MET		
437	L/K/D	3.5	100	N/A	30	15
438	L/K/D	3.1	91	N/A	31	16
439	Bedroom	1.6	65	MET		
440	L/K/D	2	85	N/A	32	10
441	Bedroom	1.6	84	MET		
442	Bedroom	2.1	96	MET		
443	L/K/D	2.3	100	N/A	39	9
444	Bedroom	2	99	MET		
445	L/K/D	1.5	90	MET		
446	Bedroom	1.1	29	MET		
447	L/K/D	1.7	26	MET		

Table 22: Assessment Data

Fig. 23: Floor Plan

Block KL

Second Floor - continued

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
448	Bedroom	2	99	MET		
449	L/K/D	1.5	94	MET	39	9
450	Bedroom	1.8	50	MET		
451	L/K/D	1.4	29	MET	17	3
452	Bedroom	2.1	99	MET		
453	L/K/D	1.6	97	MET	40	10
454	Bedroom	2.1	99	MET		
455	Bedroom	1.9	34	MET		
456	L/K/D	1.3	26	MET		
457	L/K/D	1.6	99	MET	41	11
458	Bedroom	2.5	97	MET		
459	Bedroom	1.7	35	MET		
460	L/K/D	1.6	26	MET	9	0
461	L/K/D	1.6	100	MET	41	11
462	Bedroom	2.2	99	MET		
463	Bedroom	1.4	33	MET		

Table 23: Assessment Data

Fig. 24: Floor Plan

Block KL

Third Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK KL - LEVEL 03						
464	Bedroom	2.9	97	MET		
465	Bedroom	2.6	86	MET		
466	Bedroom	1.6	79	N/A		
467	Bedroom	3.3	96	MET		
468	Bedroom	1.7	87	MET		
469	Bedroom	2.7	98	MET		
470	Bedroom	2.7	94	MET		
471	Bedroom	3	89	MET		
472	Bedroom	0.4	61	MET		
473	L/K/D	0.9	75	N/A	47	8
474	Bedroom	1.8	71	MET		
475	L/K/D	2.4	96	N/A	54	11
476	Bedroom	3.7	93	MET		
477	Bedroom	2.8	99	MET		
478	Bedroom	2	80	MET		
479	L/K/D	1.2	48	MET	29	5
480	L/K/D	1.4	99	MET	36	6
481	Bedroom	2.9	99	MET		
482	Bedroom	2.8	99	MET		
483	Bedroom	2.2	67	MET		
484	L/K/D	1.2	60	MET	31	7
485	L/K/D	1.4	98	MET	39	9
486	Bedroom	2.8	92	MET		
487	Bedroom	2.5	91	MET		
488	L/K/D	1.2	81	MET	33	7
489	Bedroom	2.1	97	MET		
490	Bedroom	3	99	MET		
491	L/K/D	1.2	79	MET		
492	Bedroom	1.8	88	MET		
493	Bedroom	2.4	72	MET		
494	Bedroom	2.7	86	MET		
495	L/K/D	3.1	99	N/A	24	7
496	Bedroom	4.3	99	MET		
497	L/K/D	4.3	100	N/A	56	17
498	L/K/D	4.3	100	N/A	67	20
499	Bedroom	3.1	93	MET		
500	L/K/D	2.5	91	N/A	48	14
501	Bedroom	1.9	94	MET		
502	Bedroom	1.5	92	MET		
503	L/K/D	2.6	100	N/A	43	11
504	Bedroom	2.3	99	MET		

Table 24: Assessment Data

Fig. 25: Floor Plan

Block KL

Third Floor - continued

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
505	L/K/D	1.8	100	MET		
506	Bedroom	1.4	43	MET		
507	L/K/D	1.6	38	MET		
508	Bedroom	2.3	99	MET		
509	L/K/D	1.8	100	MET	43	11
510	Bedroom	1.8	58	MET		
511	L/K/D	1.7	35	MET	24	6
512	Bedroom	2.3	99	MET		
513	L/K/D	1.8	100	MET	42	11
514	Bedroom	2.3	99	MET		
515	Bedroom	2	46	MET		
516	L/K/D	1.5	34	MET		
517	L/K/D	1.8	100	MET	42	11
518	Bedroom	2.7	97	MET		
519	Bedroom	1.8	46	MET		
520	L/K/D	1.7	55	MET	21	2
521	L/K/D	1.8	100	MET	43	11
522	Bedroom	2.4	99	MET		
523	Bedroom	1.6	55	MET		

Table 25: Assessment Data

Fig. 26: Floor Plan

Block M

First Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK M - LEVEL 01						
524	Bedroom	4.4	100	MET		
525	L/K/D	1.9	92	N/A		
526	Bedroom	0.9	38	MET		
527	L/K/D	0.6	13	MET		
528	Bedroom	0.7	19	MET		
529	Bedroom	1	29	MET		
530	L/K/D	0.4	11	N/A		
531	Bedroom	0.7	23	MET		

Table 26: Assessment Data

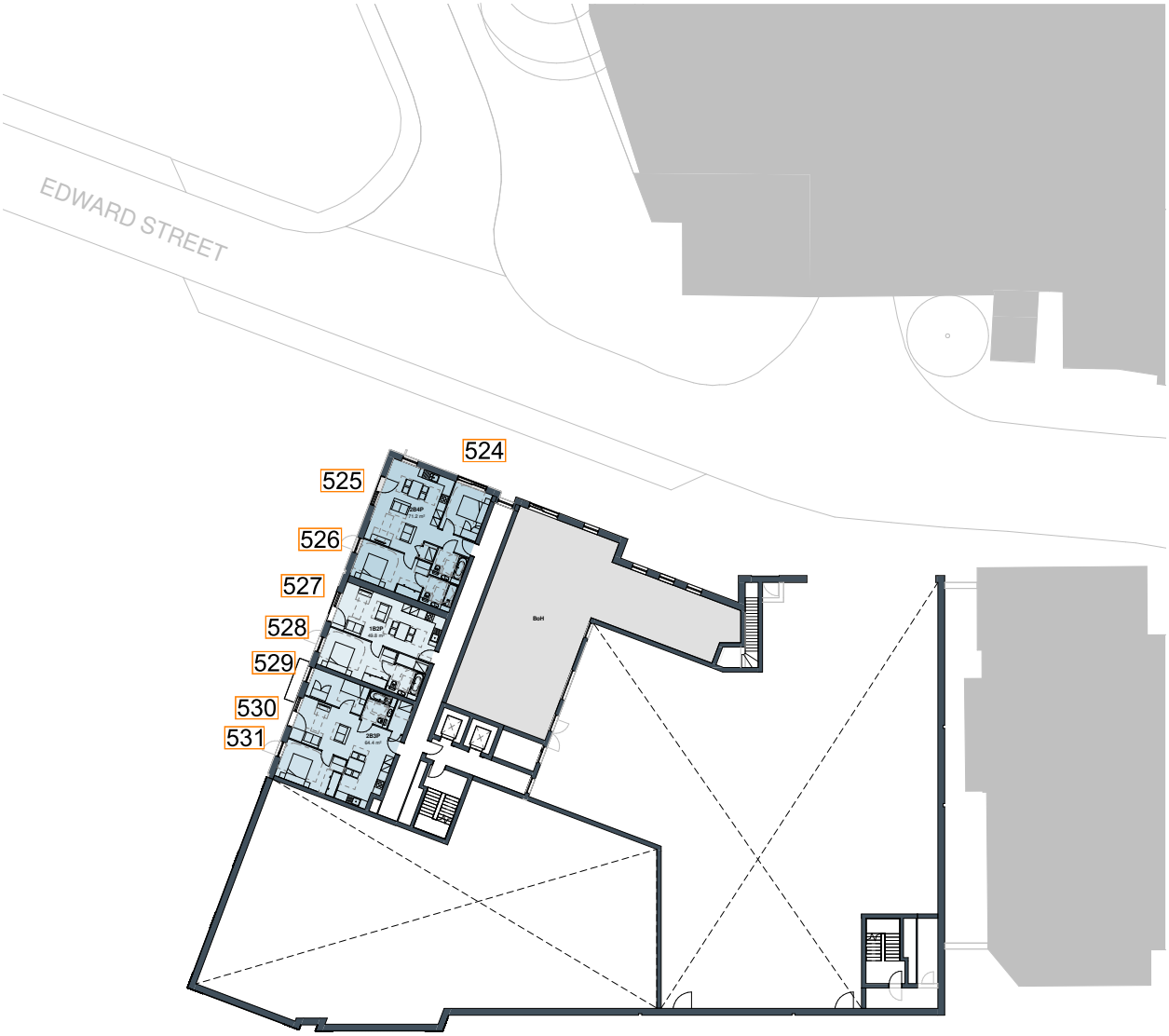


Fig. 27: Floor Plan

Block M

Second Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK M - LEVEL 02						
532	Bedroom	4.2	100	MET		
533	L/K/D	2.2	92	N/A		
534	Bedroom	1	43	MET		
535	L/K/D	0.9	24	MET		
536	Bedroom	0.9	33	MET		
537	Bedroom	1.2	46	MET		
538	L/K/D	0.8	21	N/A		
539	Bedroom	0.8	38	MET		
540	Bedroom	0.6	18	MET		
541	L/K/D	0.6	17	MET		
542	Bedroom	0.5	14	MET		
543	L/K/D	2.1	77	N/A	36	12
544	Bedroom	2.7	97	MET		
545	L/K/D	2	96	N/A	48	10
546	Bedroom	2.2	97	MET		
547	Bedroom	2.2	90	MET		
548	L/K/D	1.9	81	MET	32	4
549	Bedroom	3.6	97	MET		
550	Bedroom	2.2	91	MET		
551	L/K/D	1.7	85	MET	46	13
552	L/K/D	1	47	MET	36	11
553	Bedroom	3.6	99	MET		
554	Bedroom	2.3	93	MET		
555	Bedroom	2.7	94	MET		
556	L/K/D	2.4	92	NOT MET	43	12
557	Bedroom	3.1	97	MET		
558	Bedroom	4.2	100	MET		
559	Bedroom	4.1	100	MET		
560	Bedroom	1.4	31	MET		
561	L/K/D	1.3	27	MET		
562	L/K/D	1.4	45	MET		
563	L/K/D	1.7	65	MET		
564	Bedroom	1.7	63	N/A		

Table 27: Assessment Data

Fig. 28: Floor Plan

Block M

Second Floor

		DAYLIGHT QUANTUM	DAYLIGHT DISTRIBUTION		SUNLIGHT QUANTUM (PROBABLE SUNLIGHT HOURS)	
ROOM REF.	ROOM USE	ADF (%)	NSL (%)	RDC	ANNUAL	WINTER
BLOCK M - LEVEL 03						
565	Bedroom	4.3	100	MET		
566	L/K/D	2.6	93	N/A		
567	Bedroom	1.2	52	MET		
568	L/K/D	1.2	55	MET		
569	Bedroom	1.1	75	MET		
570	Bedroom	1.5	98	MET		
571	L/K/D	0.8	45	N/A		
572	Bedroom	1	84	MET		
573	Bedroom	0.7	26	MET		
574	L/K/D	0.7	25	MET		
575	Bedroom	0.6	17	MET		
576	L/K/D	2.3	82	N/A	46	16
577	Bedroom	2.9	97	MET		
578	L/K/D	2.1	98	N/A	62	14
579	Bedroom	2.4	98	MET		
580	Bedroom	2.4	98	MET		
581	L/K/D	2	87	MET	40	5
582	Bedroom	2.5	87	MET		
583	Bedroom	2.5	94	MET		
584	L/K/D	2	91	MET	46	13
585	L/K/D	1.1	53	MET	43	15
586	Bedroom	3.6	99	MET		
587	Bedroom	2.3	93	MET		
588	Bedroom	2.7	93	MET		
589	Bedroom	2.3	86	NOT MET		
590	Bedroom	2.8	95	NOT MET		
591	Bedroom	3.2	97	MET		
592	Living Room	2.2	86	MET	58	13
593	Living Room	2.3	78	MET	50	7
594	Bedroom	4.3	100	MET		
595	Bedroom	4.2	100	MET		
596	Living Room	2.2	91	MET	51	10
597	Bedroom	1.6	88	MET		
598	Bedroom	1.4	62	MET		
599	Bedroom	1.7	64	MET		
600	Bedroom	2.4	95	N/A		

Table 28: Assessment Data

Fig. 29: Floor Plan

8 DAYLIGHT & SUNLIGHT POTENTIAL

8.1 DAYLIGHT POTENTIAL ASSESSMENTS

VSC FAÇADE ASSESSMENT - BLOCK E, E/F, H

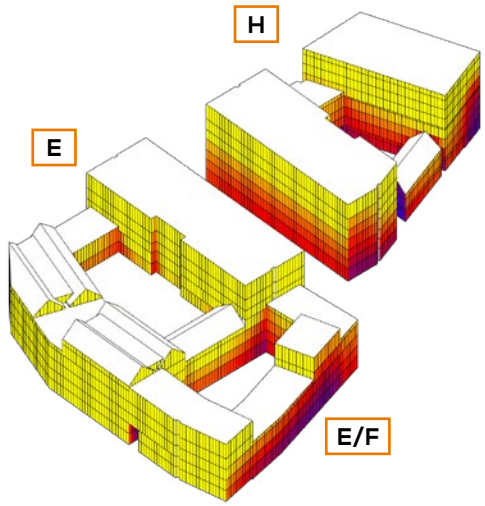


Fig. 30: Daylight Potential - view 1

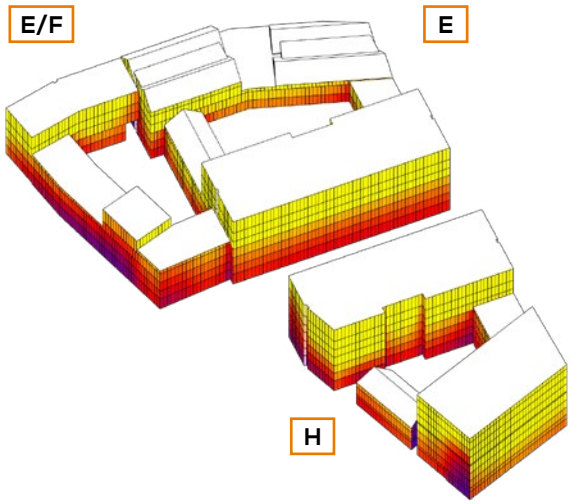


Fig. 31: Daylight Potential - view 2

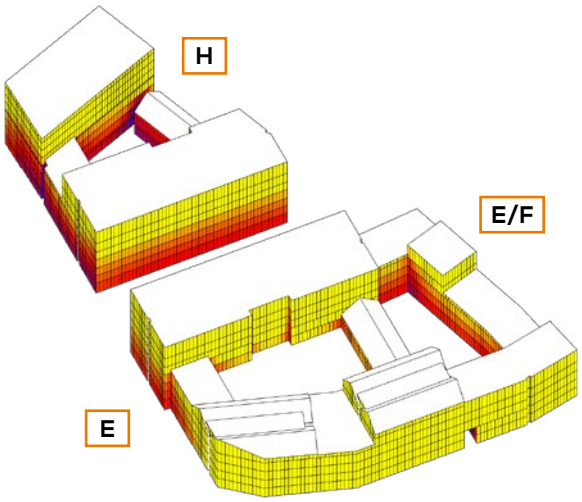


Fig. 32: Daylight Potential - view 3

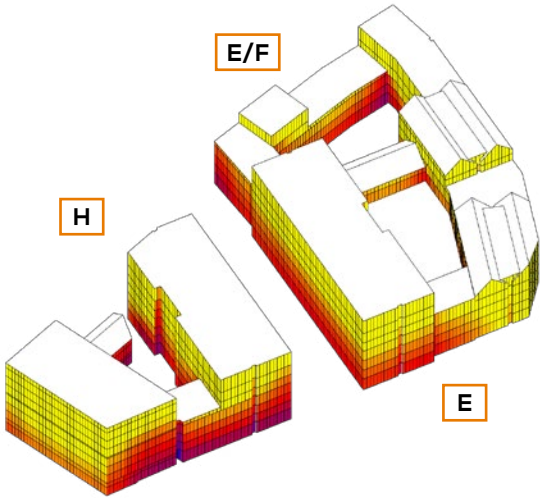
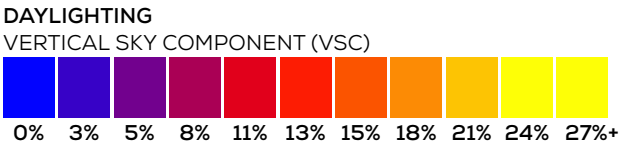
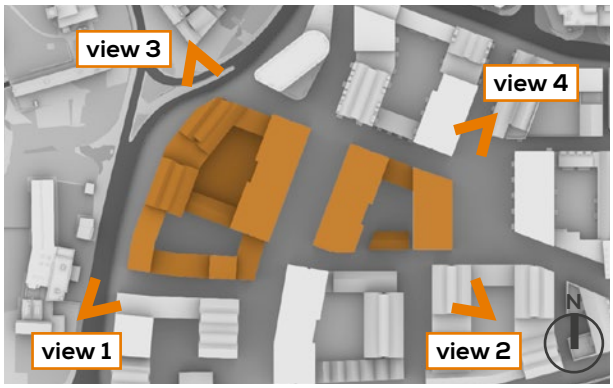


Fig. 33: Daylight Potential - view 4





VSC FAÇADE ASSESSMENT - BLOCK F, G, J

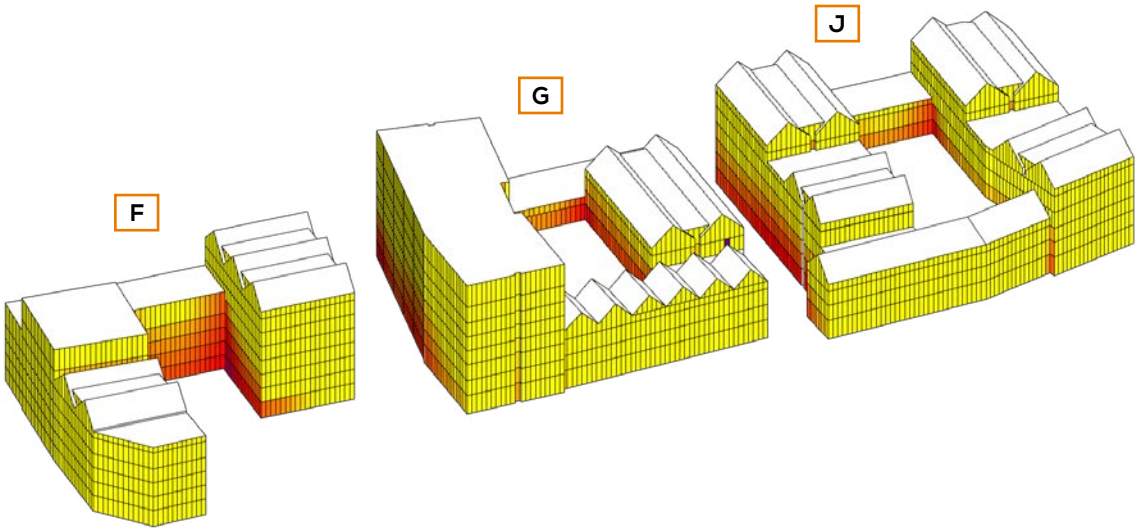


Fig. 34: Daylight Potential - view 1

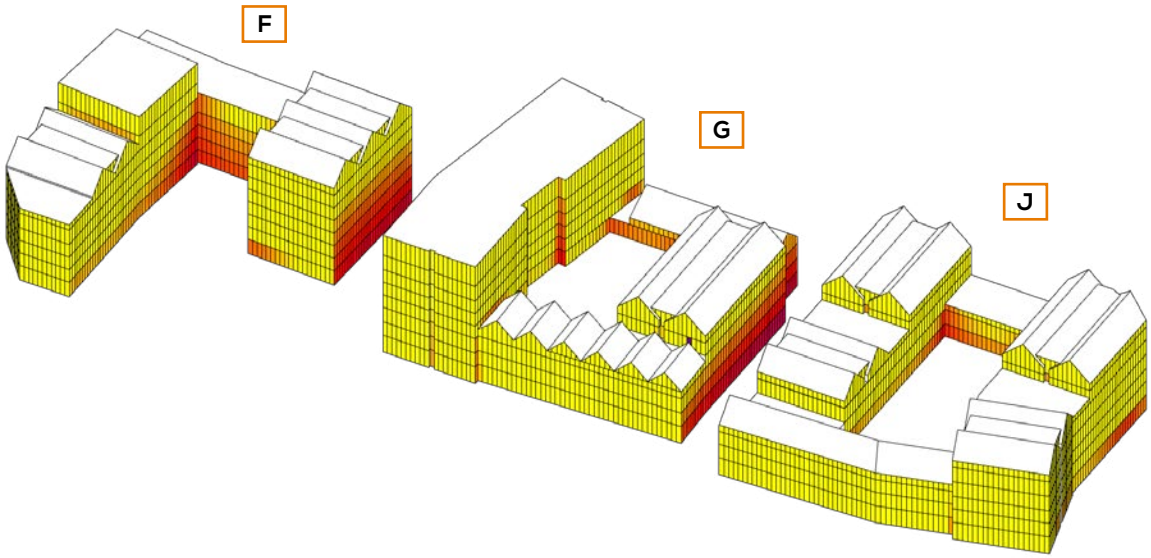
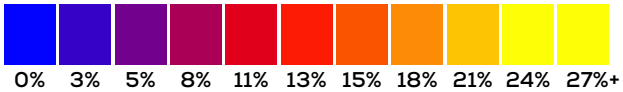
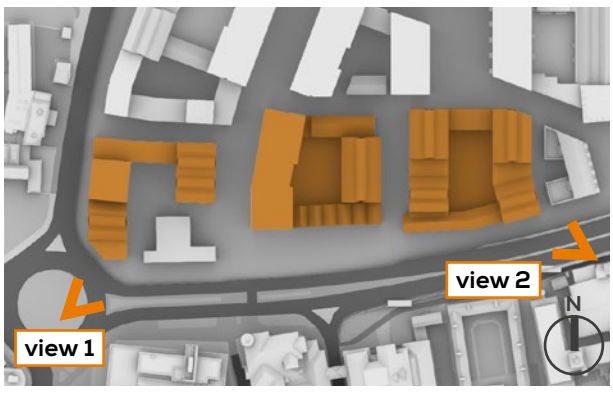


Fig. 35: Daylight Potential - view 2

DAYLIGHTING
VERTICAL SKY COMPONENT (VSC)





VSC FAÇADE ASSESSMENT - BLOCK F, G, J

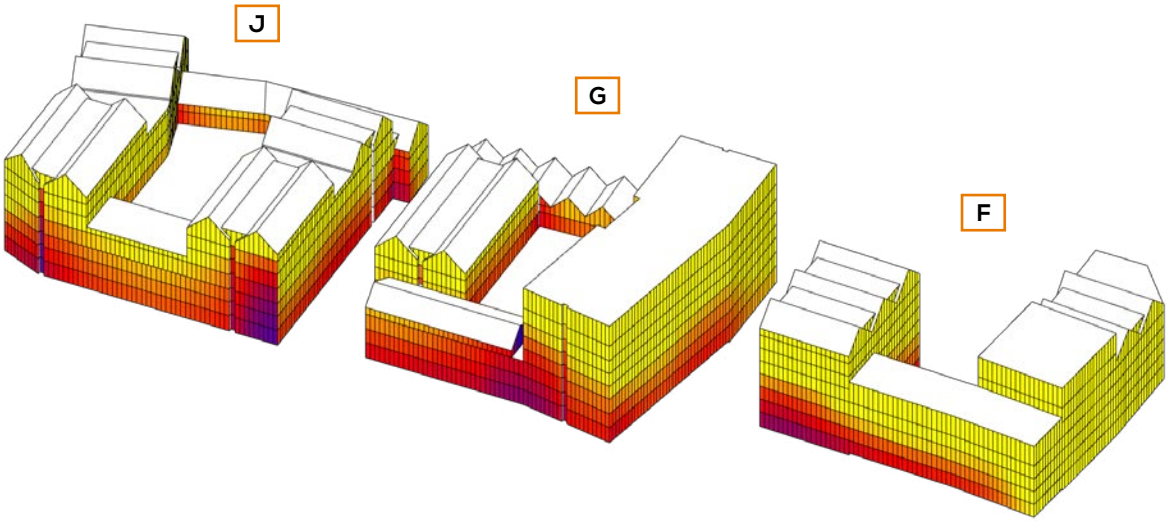


Fig. 36: Daylight Potential - view 3

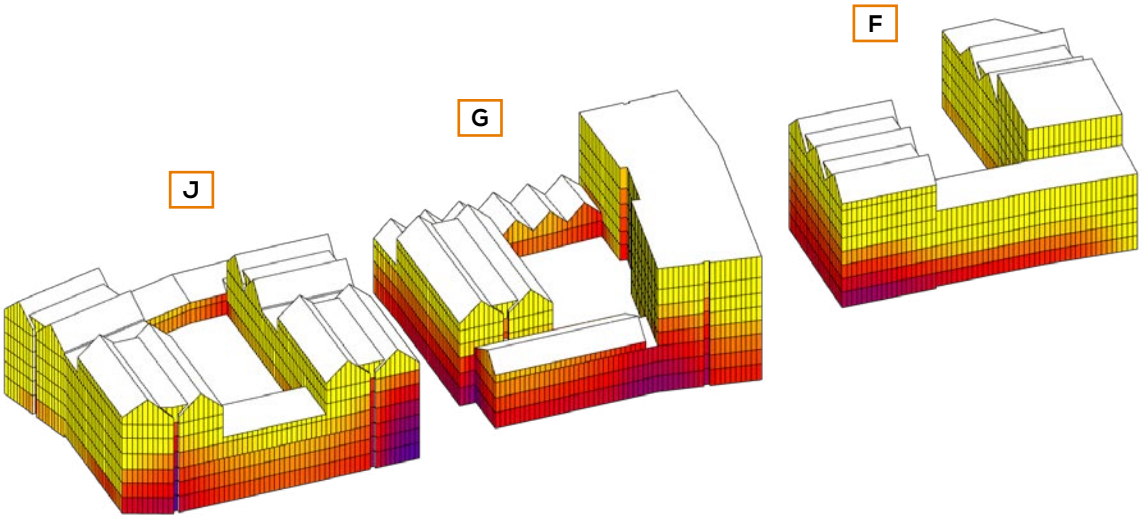
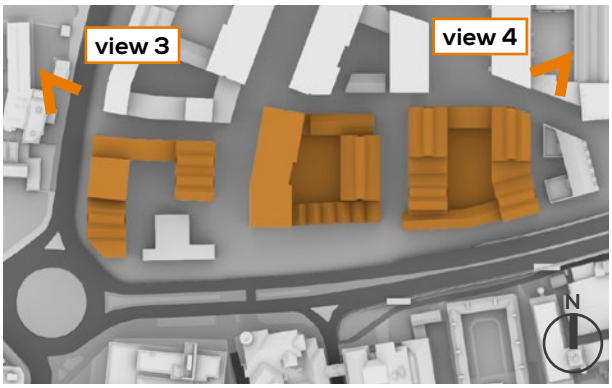


Fig. 37: Daylight Potential - view 4



DAYLIGHTING
VERTICAL SKY COMPONENT (VSC)

PSH FAÇADE ASSESSMENT - BLOCK E, E/F, H

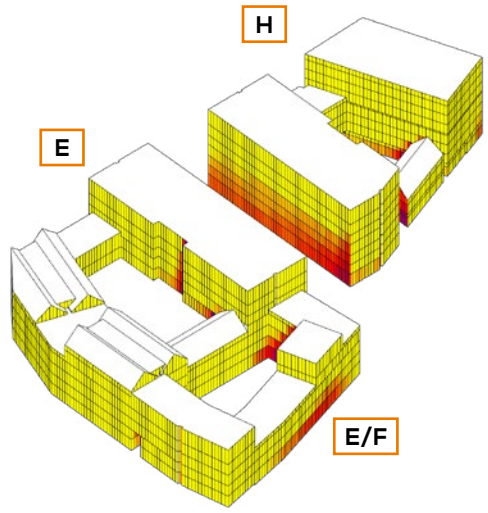


Fig. 38: Annual Probable Sunlight Hours - view 1

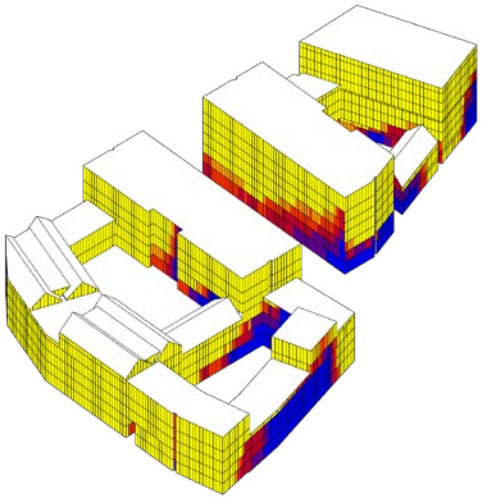


Fig. 39: Winter Probable Sunlight Hours - view 1

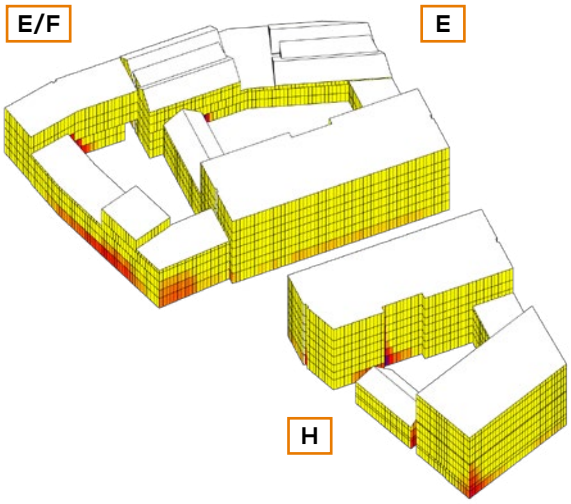


Fig. 40: Annual Probable Sunlight Hours - view 2

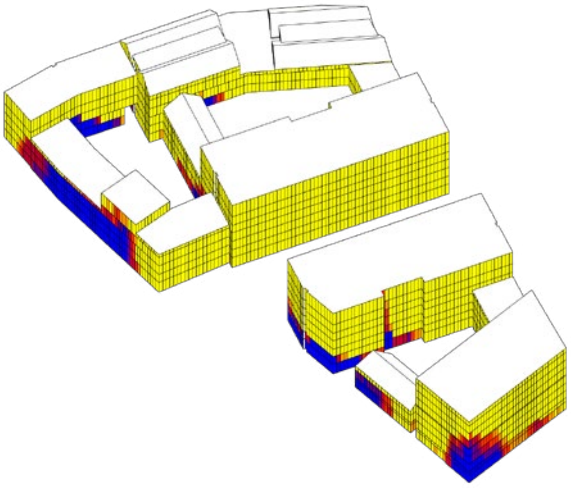
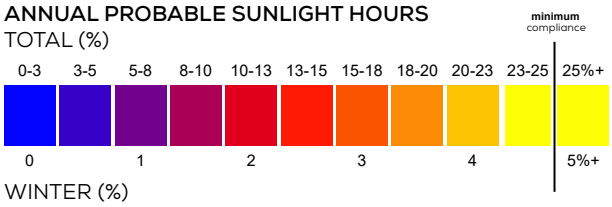
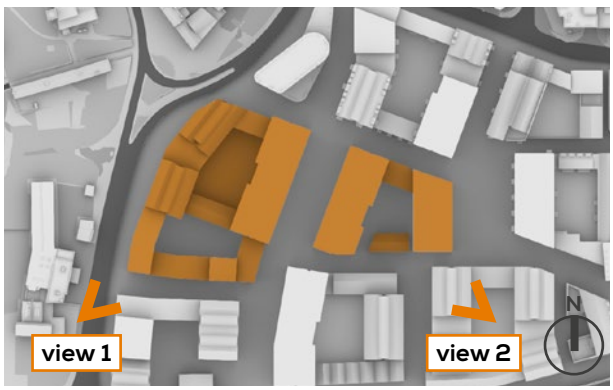


Fig. 41: Winter Probable Sunlight Hours - view 2





PSH FAÇADE ASSESSMENT - BLOCK F, G, J

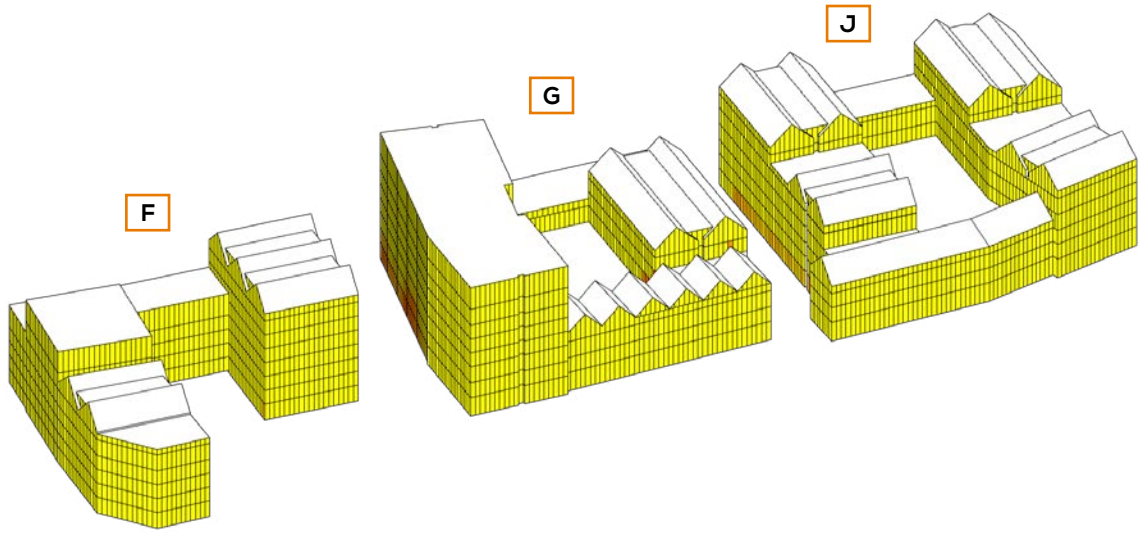


Fig. 42: Annual Probable Sunlight Hours

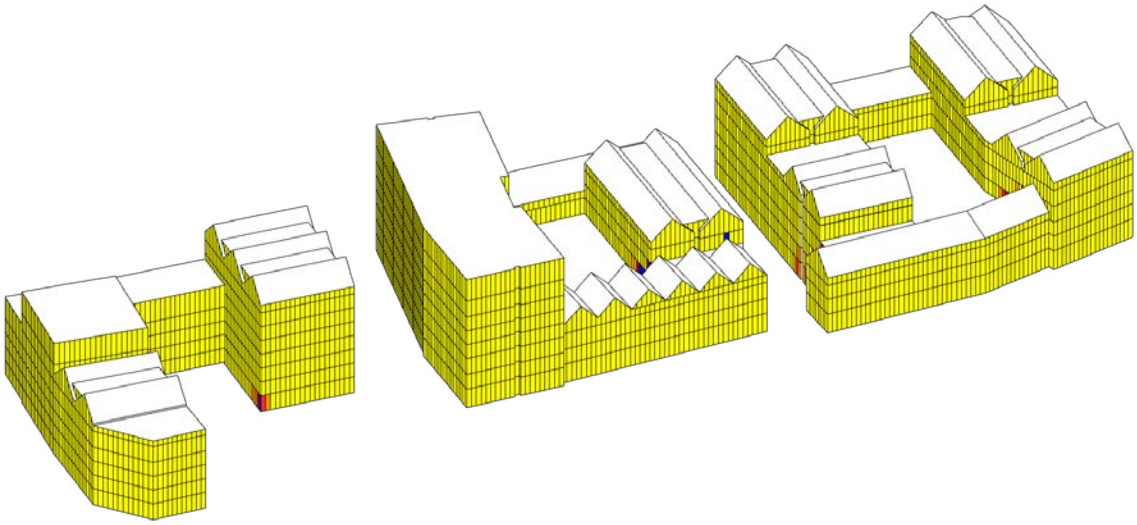
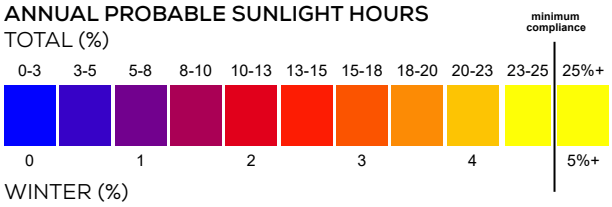
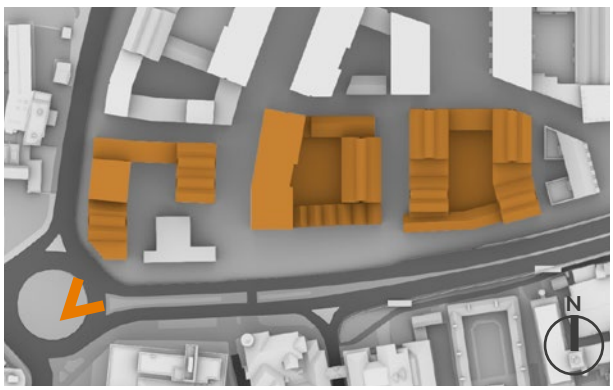


Fig. 43: Winter Probable Sunlight Hours





PSH FAÇADE ASSESSMENT - BLOCK F, G, J

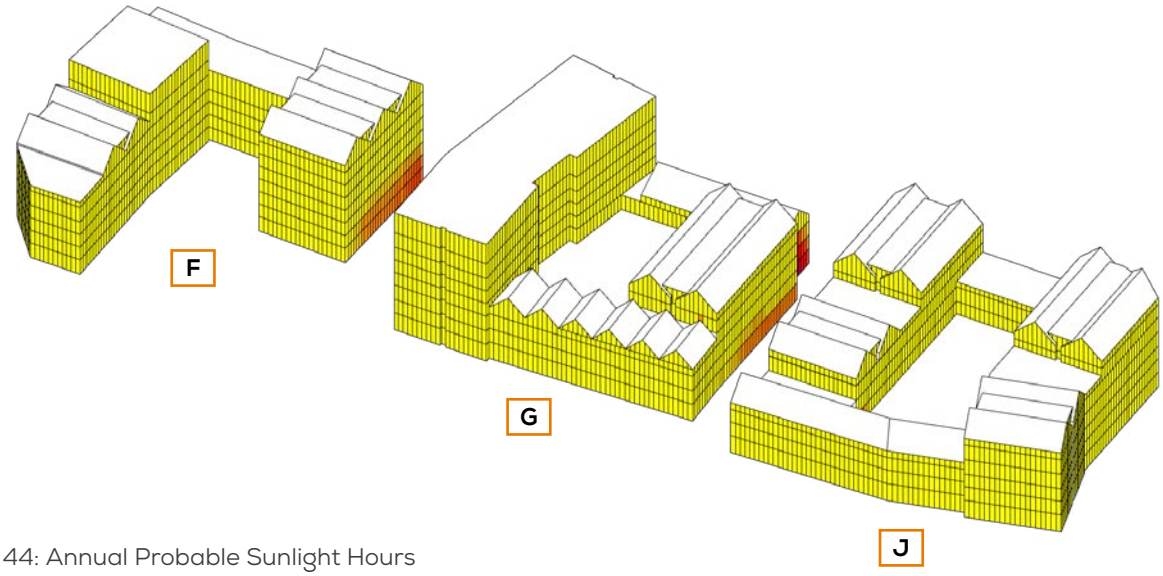


Fig. 44: Annual Probable Sunlight Hours

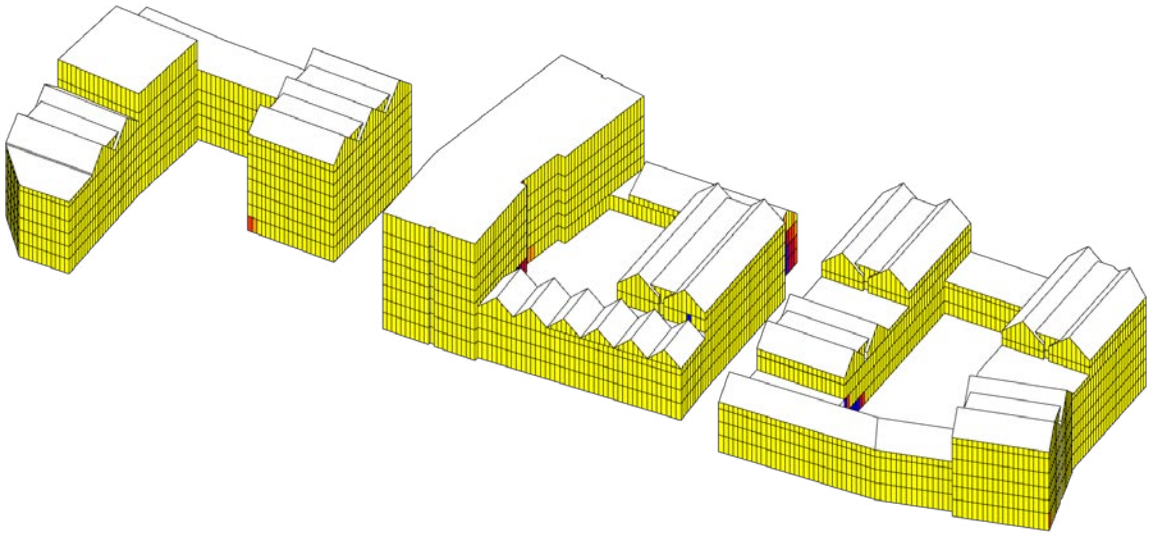
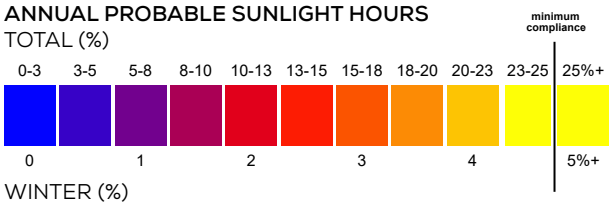
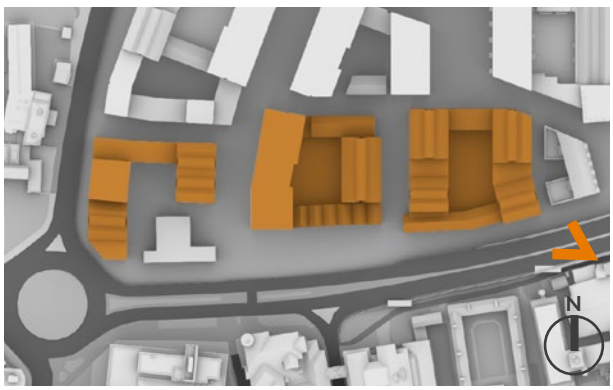


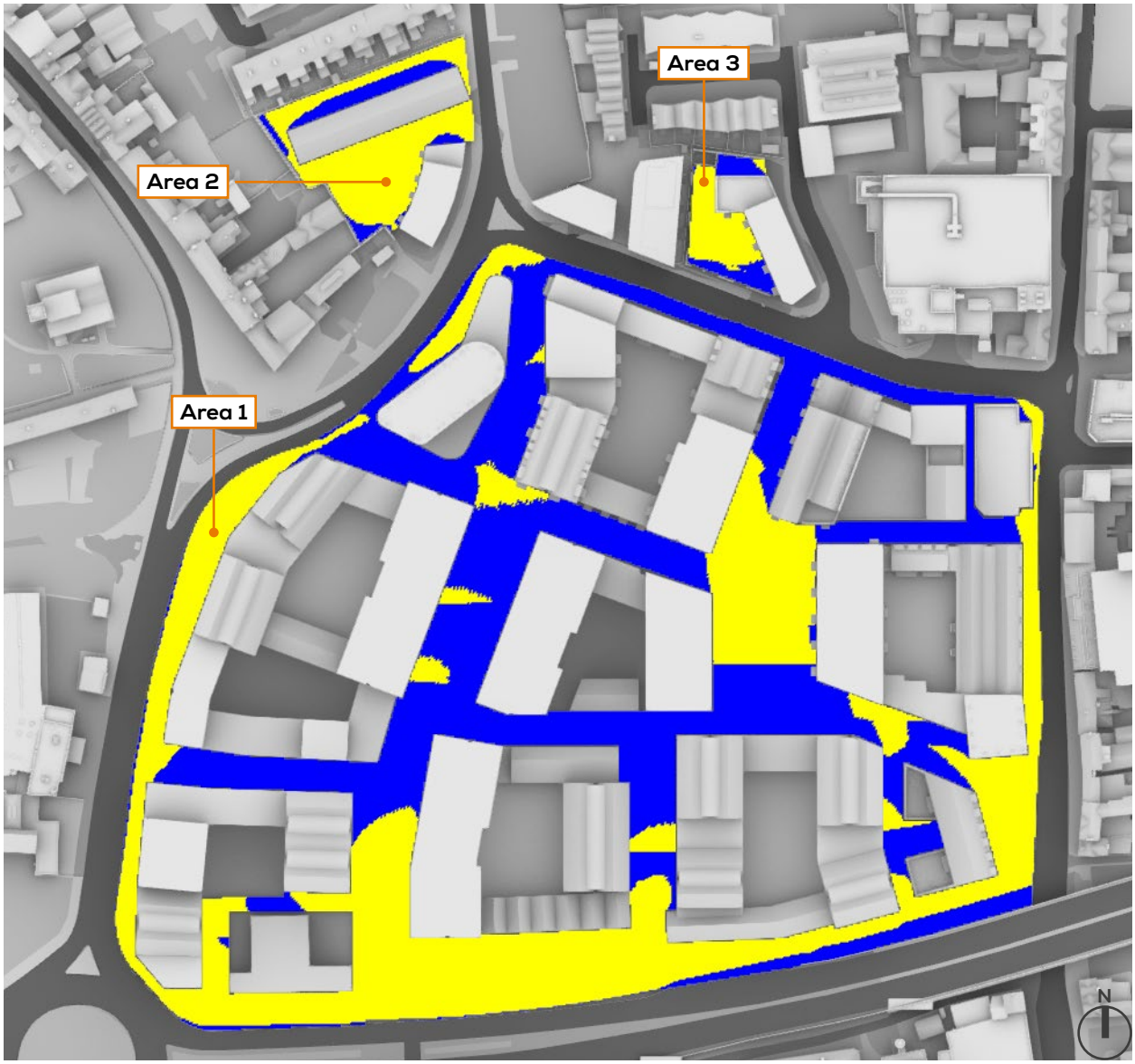
Fig. 45: Winter Probable Sunlight Hours





9 OVERSHADOWING ASSESSMENTS

OVERSHADOWING ASSESSMENT - PUBLIC OPEN SPACE
SUN HOURS ON GROUND - BRE TEST (21ST MARCH)

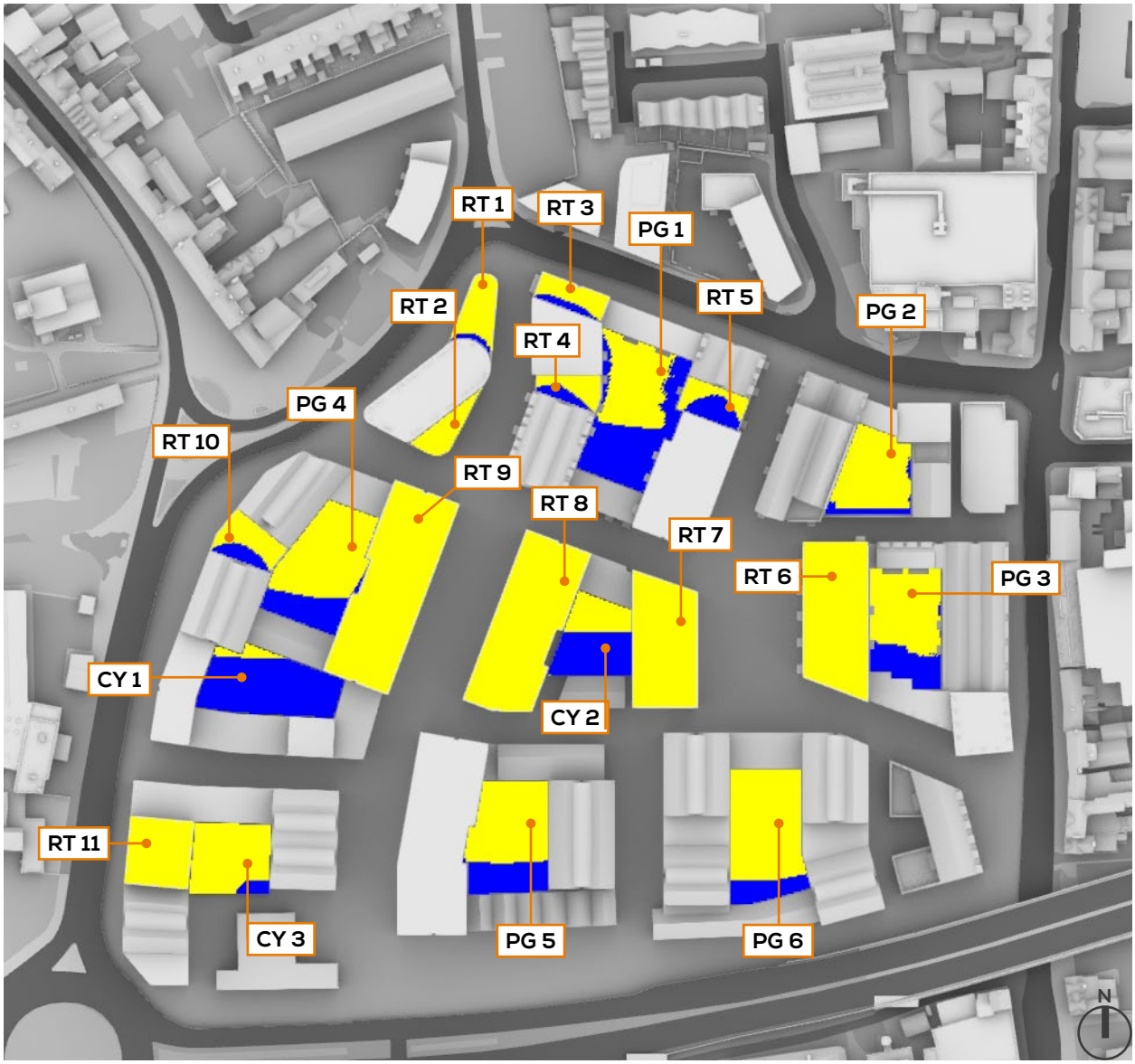


(BRE RECOMMENDS 2+ HOURS OF SUNLIGHT ON 21ST MARCH FOR AT LEAST 50% OF THE OPEN SPACE)

AREA 1: 49%
AREA 2: 79%
AREA 3: 66%

SUN HOURS ON GROUND
BRE TEST - 21ST MARCH

OVERSHADOWING ASSESSMENT - ROOF TERRACE/ PODIUM GARDEN/ COURTYARD
SUN HOURS ON GROUND - BRE TEST (21ST MARCH)



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

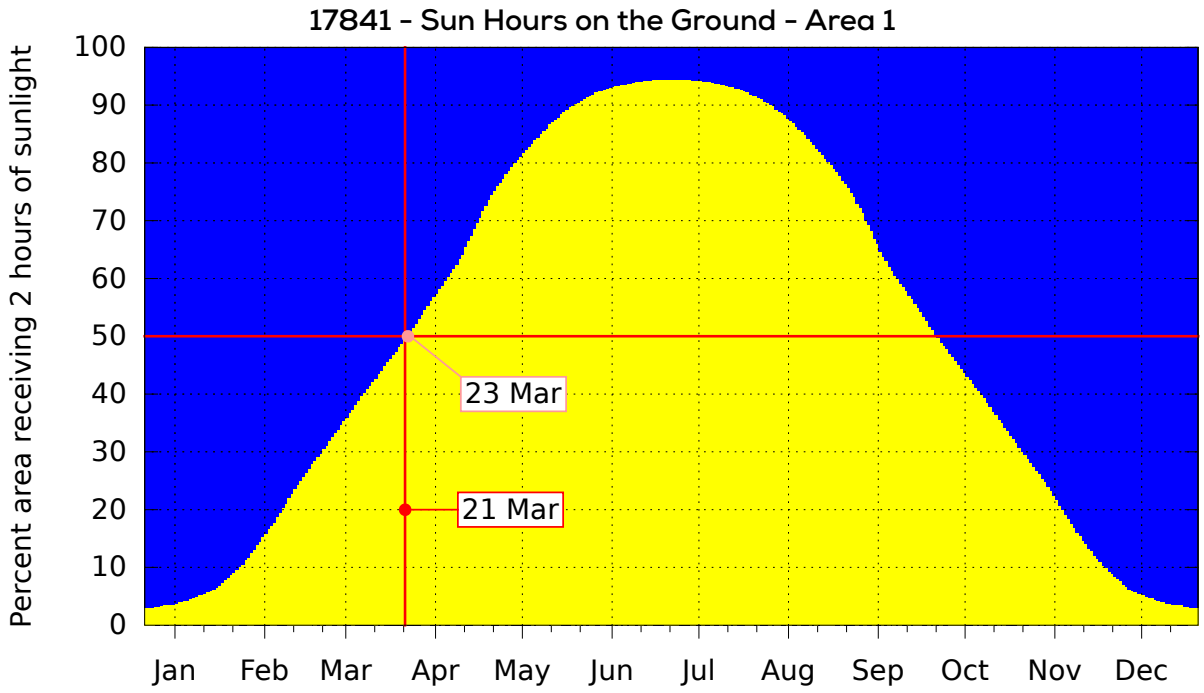
RT 1: 90%
RT 2: 100%
RT 3: 77%
RT 4: 69%
RT 5: 51%
RT 6: 100%
RT 7: 100%
RT 8: 100%
RT 9: 100%
RT 10: 72%
RT 11: 100%
PG 1: 46%
PG 2: 87%
PG 3: 71%
PG 4: 74%
PG 5: 71%
PG 6: 83%
CY 1: 8%
CY 2: 38%
CY 3: 93%

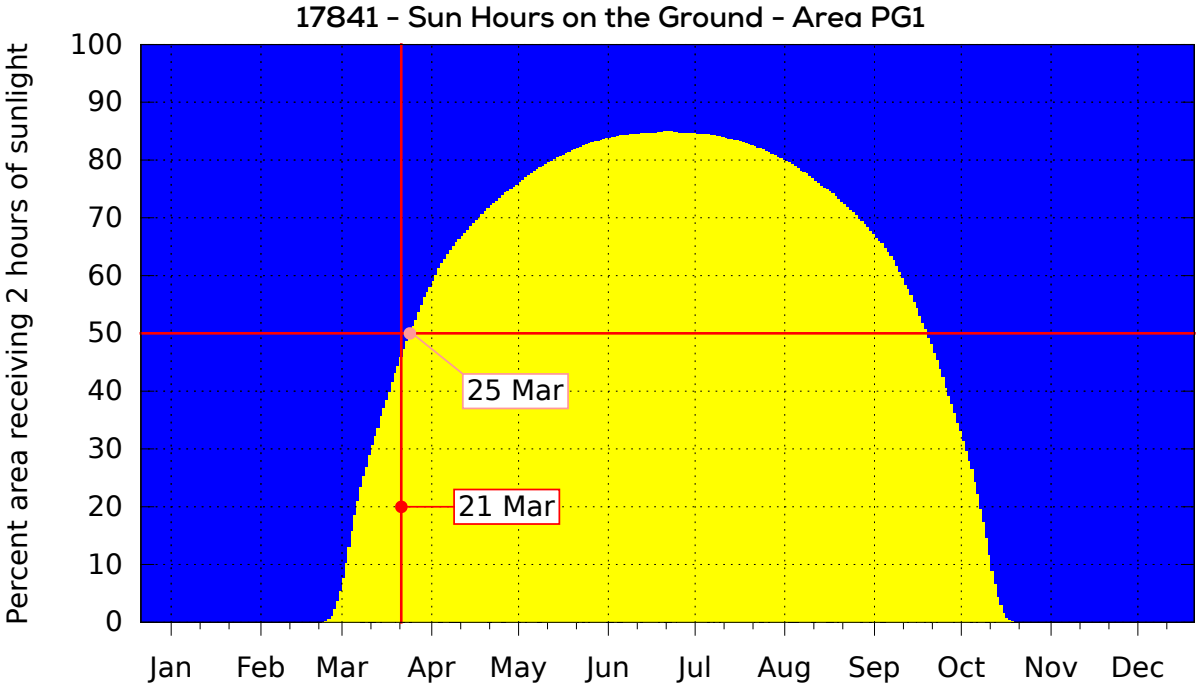
SUN HOURS ON GROUND
BRE TEST - 21ST MARCH

<2 2+

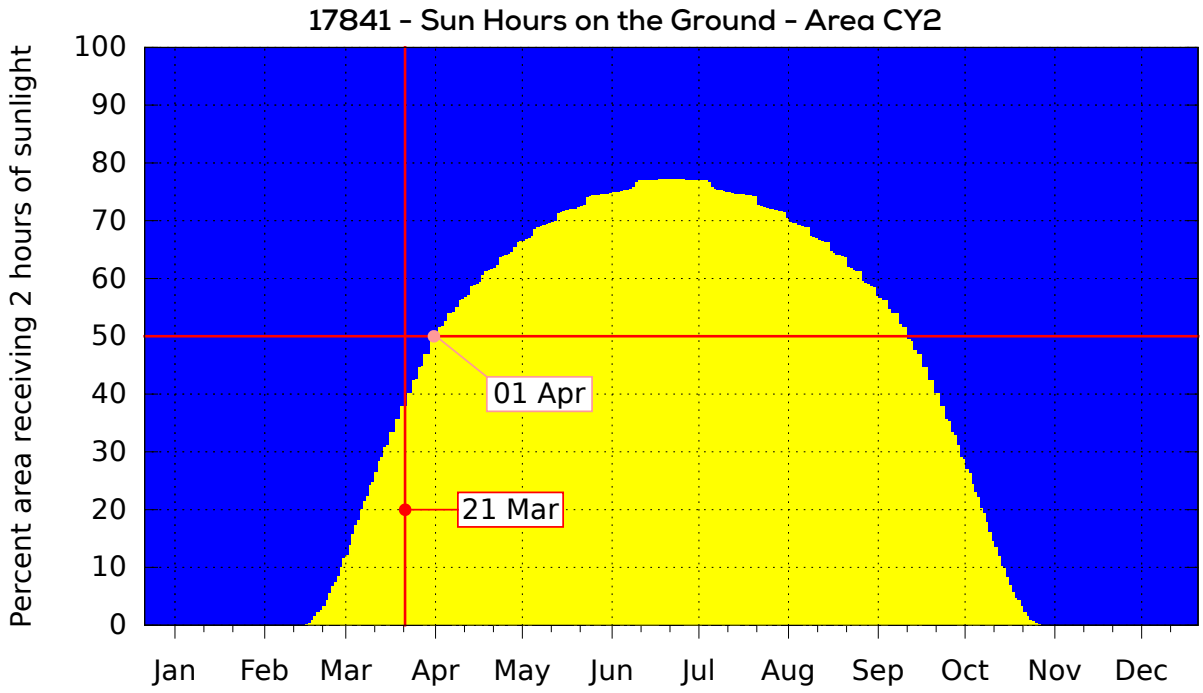
OVERSHADOWING ASSESSMENT

SUN HOURS ON GROUND - BRE TEST (21ST MARCH)





SUN HOURS ON GROUND - BRE TEST (21ST MARCH)



OVERSHADOWING ASSESSMENT - PUBLIC OPEN SPACE
SUN EXPOSURE ON GROUND - 21ST MARCH

SUN EXPOSURE
TOTAL HOURS

21st MARCH (SPRING EQUINOX)

LONDON

Latitude:	52.6
Longitude:	1.3
Sunrise:	05:55 GMT
Sunset:	18:09 GMT

Total Available Sunlight:
12hrs 14mins

OVERSHADOWING ASSESSMENT - ROOF TERRACE/ PODIUM GARDEN/ COURTYARD
SUN EXPOSURE ON GROUND - 21ST MARCH

SUN EXPOSURE
TOTAL HOURS

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

21st MARCH
(SPRING EQUINOX)

LONDON
Latitude: 52.6
Longitude: 1.3
Sunrise: 05:55 GMT
Sunset: 18:09 GMT

Total Available Sunlight:
12hrs 14mins

OVERSHADOWING ASSESSMENT - PUBLIC OPEN SPACE
SUN EXPOSURE ON GROUND - 21ST JUNE

SUN EXPOSURE
TOTAL HOURS

21st JUNE
(SUMMER SOLSTICE)

LONDON

Latitude:	52.6
Longitude:	1.3
Sunrise:	04:30 GMT
Sunset:	21:22 GMT

Total Available Sunlight:
16hrs 51mins

OVERSHADOWING ASSESSMENT - ROOF TERRACE/ PODIUM GARDEN/ COURTYARD
SUN EXPOSURE ON GROUND - 21ST JUNE

SUN EXPOSURE
TOTAL HOURS

21st JUNE
(SUMMER SOLSTICE)

LONDON

Latitude:	52.6
Longitude:	1.3
Sunrise:	04:30 GMT
Sunset:	21:22 GMT

Total Available Sunlight:
16hrs 51mins

gia
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