



DAYLIGHT & SUNLIGHT

DESIGN GUIDE

Northfleet, Gravesham Masterplan

21 September 2022

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CONTENTS

1	OBJECTIVE	2
2	BRE GUIDELINES	3
3	METHODOLOGY	7
4	CONCLUSIONS	8
5	SITE OVERVIEW	12
6	DAYLIGHT POTENTIAL ASSESSMENT	14
7	SUNLIGHT POTENTIAL ASSESSMENT	28
8	OVERSHADOWING ASSESSMENTS	42

1 OBJECTIVE

The purpose of this report is twofold: firstly, it aims to ascertain the potential of the Proposed Development to offer acceptable internal daylight and sunlight amenity for the enjoyment of future occupants; secondly, it provides guidance to be used by the design team at the detailed design and Reserved Matters Application stage to ensure that the design makes the most of the daylight and sunlight available on Site.

In accordance with the Building Research Establishment handbook 'Site Layout Planning for Daylight and Sunlight a Guide to Good Practice (2022)' (the "BRE Guidance"), GIA has undertaken following:

- Carry out a daylight assessment using the methodologies set out in the BRE guidance for Vertical Sky Component (VSC);
- Carry out a sunlight assessment using the methodologies set out in the BRE guidance for Sunlight Exposure;
- Carry out an overshadowing assessment using the methodology set out in the BRE guidance for Sun Hours On Ground for all relevant amenity areas; and
- Prepare a report setting out the analysis and our findings.

2 BRE GUIDELINES

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

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

The BR 209 new edition contains amended methodologies for appraising the daylight and sunlight quality within new developments. Nonetheless, the main aim of the guidance is maintained: *"to help rather than constrain the designer"* as stated in Paragraph 1.6 of the new guidance.

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

1.1 BS EN 17037:2018 AND THE UK ANNEX

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

Following a review of the European Standard by a dedicated commission of UK experts, the British Standard Institution concluded that the targets suggested *"may not be achievable for some buildings, particularly dwellings"*. In particular, the UK committee believed this could be the case for *"dwellings with basement rooms or those with significant external obstructions (for example, dwellings situated in a dense urban area or with tall trees outside), or for existing buildings being refurbished or converted into dwellings"*

As a consequence, a UK National Annex was appended to BS EN 17037:2018 which suggested alternative targets, in line with those of the former BS8206-2:2008 and the previous (2011) BR209. These lower targets were then incorporated into the 2022 publication of BR209.

With this site being located within central Harlow, an emerging dense urban environment, the relevant targets are considered to be those contained within the UK National Annex as outlined and discussed further in Section 3.2 adjacent. It is important here to re-emphasise though that these UK targets were designed to be in line with those from the previous British Standard and BR209 publications and so utilising them does not represent a weakening of standards, rather it enables continuity in the understanding of daylight levels within residential developments.

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

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

1.2 DAYLIGHT

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

BS EN 17037 suggests two possible methodologies for appraising daylight:

- Illuminance Method
- Daylight Factor Method

These methodologies are discussed in more detail below.

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

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

Vertical Sky Component (VSC)

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

The VSC method is a useful 'rule of thumb' but has some significant limitations in determining the true quality of daylight within a proposed building. It does not take into account the size of the window, any reflected light off external obstructions, any reflected light within the room, or the use to which that room is put.

Illuminance method

Climate Based Daylight Modelling (CBDM) is used to predict daylight illuminance using sun and sky conditions derived from standard meteorological

data (often referred to as climate or weather data). This analytical method allows the prediction of absolute daylight illuminance based on the location and building orientation, in addition to the building's daylight systems (shading systems, for example). Annex A within the BS EN 17037 proposes values of target illuminances and minimum target illuminances to exceed 50 % of daylight hours.

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

Spatial Daylight Autonomy (sDA)

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

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

As discussed within Section 3.1, the National Annex suggests that these targets can be challenging to achieve within residential settings, particularly in areas of higher density and so suggests lower targets can be considered in this situation. It should be noted here that the reduced targets suggested within the BS EN 17037:2018 National Annex are provided so as to be comparable with the previous BR209's recommendations for ADF. These targets, considered relevant for this application, are:

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

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

could use discretion here. For example, the target for a living room could be used for a combined living/dining/kitchen area if the kitchens are not treated as habitable spaces, as it may avoid small separate kitchens in a design”.

Daylight Factor method

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

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

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

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

1.3 SUNLIGHT

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

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

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

The guide proposes minimising the number of dwellings whose living room face solely north unless

there is some compensating factor such as an appealing view to the north, and it suggests a number of techniques to do so. Furthermore, it discusses massing solutions with a sensitive approach to overshadowing, so as to maximize access to sunlight.

At the same time, it acknowledges that the site’s existing urban environment may impose orientation or overshadowing constraints which may not be possible to overcome.

To quantify sunlight access for interiors where sunlight is expected, it refers to the BS EN 17037 criterion that the minimum duration of sunlight exposure in at least one habitable room of a dwelling should be 1.5 h on March 21st. Table A.5 also establishes medium and high sunlight targets (3 and 4 hours).

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

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

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

- *At least one main window faces within 90 degrees of due south, and*
- *a habitable room, preferably a main living room, can receive a total of at least 1.5 hours of sunlight on 21 March. This is assessed at the inside centre of the window(s); sunlight received by different windows can be added provided they occur at different times and sunlight hours are not double counted.. ”*

1.4 OVERSHADOWING

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

“Sunlight in the spaces between and around buildings

has an important impact on the overall appearance and ambience of a development. It is valuable for a number of reasons, to:

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

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

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

"3. 3 .17 It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March. If as a result of new development an existing garden or amenity area does not meet the above, and the area that can receive two hours of sun on 21 March is less than 0.80 times its former value, then the loss of sunlight is likely to be noticeable. If a detailed calculation cannot be carried out, it is recommended that the centre of the area should receive at least two hours of sunlight on 21 March.."

1.5 FURTHER RELEVANT INFORMATION

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

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

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

3 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 daylight potential, sun exposure and overshadowing assessments illustrated within this report have been undertaken on the illustrative massing with blank facades.

Whilst the detailed design may vary from the illustrative massing, this would be later covered within the Reserved Matters Application when full detailed daylight assessments would be undertaken.

The three-dimensional representation of the illustrative massing has been provided by the masterplan architects, UNStudio. This has been placed in the context of its surrounding buildings which have been modelled from photogrammetry. This allows for a precise model, which in turn ensures that the analyses accurately represents the amount of daylight and sunlight available to the building façades and external spaces considering all of the surrounding obstructions and orientation.

4 CONCLUSIONS

In order to ascertain the potential of the masterplan to provide good daylight and sunlight for future occupiers, assessments of daylight potential (Vertical Sky Component or VSC) and sunlight potential (Sun Exposure) have been undertaken on the facades of the illustrative massing.

Due to the outline nature of the application, the assessments have been undertaken on flat facades without details and therefore the impact of balconies, recesses and window reveals has not been assessed at this stage.

Whilst BRE provides recommendations for the daylight and sunlight amenity within residential accommodation only, some areas which may be allocated to commercial uses have also been included in the technical assessments. These areas have not been discussed in detail in the following paragraphs.

Daylight

The results show good daylight potential on the majority of facades, with 65.9% of the façade area assessed achieving VSC levels of 27% or above. A standard design is expected to lead to acceptable levels of daylight in the rooms located behind these areas.

27% of the assessed façade area achieves levels of VSC below 27% but greater than or equal to 15% and therefore adequate daylighting can be achieved with larger windows.

It follows that the vast majority of the façade area (92.9%) performs well (with VSC levels of 15% or above) and so, overall, the proposed massing has the potential to deliver good levels of light at detailed design stage.

5.9% of the assessed façade area achieves VSC levels below 15% and greater than or equal to 5%. Achieving acceptable daylight amenity within the rooms located in these areas is possible, provided there is no further obstruction of the sky and special measures, such as shallow layouts, enlarged windows and a careful positioning of balconies, are implemented.

Finally, only 1.2% of the assessed façade area achieves levels of VSC lower than 5%. It is recommended that these areas accommodate cores, rooms with no expectation of daylight or secondary windows. Bedrooms with maximised windows and shallow layouts could still receive adequate daylighting in these areas, however living rooms would struggle to achieve compliance. Where possible, cores or non-habitable rooms should be positioned in these areas.

The outer frontages enjoy a mostly unobstructed view of the sky and therefore these façades achieve good daylight potential (shown in yellow in the diagrams). Areas of limited daylight availability are to be expected within dense urban environments, and generally unavoidable in schemes of this size and nature. These occur mainly in the following locations:

- Where building facades are parallel and in close proximity of each other;
- In the inner corners; and
- On courtyard elevations.

In such more challenging locations, the daylight

potential is generally lowest on the bottom floors and gradually increases on the upper floors.

The areas of limited daylight potential can be addressed at detailed design stage to ensure that adequate daylight amenity is achieved within the residential accommodation. The daylight ingress within the rooms can be maximised in several ways, the most relevant of which are summarised below:

- Bedrooms should be positioned in the most constrained areas and provided with generous fenestration, whilst living areas should be located where the daylight availability is greatest and, if possible, in the corners where they can be dual aspect;
- Balconies and overhangs significantly reduce the light entering windows below them (if projecting) or behind them (if recessed) and this is exacerbated if there are large obstructions opposite. With living areas having both a higher daylight requirement than bedrooms and generally a greater expectation of sunlight, a balcony strategy should be devised so as not to cause further obstruction to this room type where the daylight availability is limited. This can be achieved through a number of different strategies, for instance by providing living areas with additional windows free of obstructions, by staggering the balconies or internal layouts so the windows serving living areas are not overhung by balconies, or even by providing oversized units without balconies. Inset balconies cause a more substantial obstruction than pop-out ones, as they also block peripheral light. Therefore, should recessed balconies be provided in areas where the daylight and sunlight availability is limited, it is recommended that either they are located in front of bedrooms, with a side access from the living areas, or that the living areas are generously glazed, shallow, and if possible, also served by secondary windows;
- Large fenestration within the areas of limited daylight availability would help maximise the daylight ingress. As a general rule, raised window heads can be particularly effective to optimise the distribution of light within the rooms and horizontal windows with solid sills are preferable to full-height windows of the same size;
- Dual-aspect living areas would enjoy greater levels of daylight as well as enhanced views;
- Keeping room depths to a minimum would allow light to reach the rear of the rooms, thus ensuring a uniform daylight distribution;
- The thickness of external walls should be kept to a minimum, whilst taking into consideration other factors such as thermal transmittance and energy performance. Splayed window reveals would help maximise the daylight ingress;
- A highly transparent glazing (with a high Visible Light Transmittance value) and thin frames would help maximise the daylight ingress into the room. Glazing specifications will have to be determined by balancing different requirements such as prevention of overheating and noise protection; and
- Light coloured exterior and interior finishes would ensure that light is reflected off the lighter surfaces and distributed evenly within the habitable rooms.

Overall, the proposed massing has the potential to deliver good-quality homes with adequate daylight amenity.

The more obstructed areas, which are typical of high-density developments, can be addressed at detailed design stage and the measures described above provide an example of how the daylight amenity within the rooms could be optimised.

At detailed design stage, this strategy can be further refined to ensure that the constraints inherent to any scheme of this nature are taken into consideration and good levels of daylight are achieved indoors.

Sunlight

With regard to sunlight, BRE recommends that at least one room within each unit (preferably a living room) should receive direct sunlight for at least one hour and a half on 21st March. With unit layouts and façade details unavailable at this stage, a sun exposure assessment has been undertaken on notional façade panels.

The assessment has shown very good sunlight potential across the scheme, with 90.4% of the panels assessed receiving direct sunlight for at least one hour and a half on the equinox; 2.7% receiving at least one hour; 2.4% receiving at least half an hour and 4.6% receiving less than half an hour.

As explained above, such assessment is based on flat facades and the sunlight availability will inevitably decrease once balconies, recesses and window reveals are taken into account. As the detailed assessment is undertaken on the inside face of the window aperture, a degree of reduction is expected once these are factored in as part of a detailed assessment. Nevertheless, the above results indicate that the massing and orientation of the blocks is generally suitable to provide adequate levels of sunlight within the dwellings.

Levels of sunlight lower than recommended are mostly seen predominantly in those facades with a northerly aspect and on the lower floors, as is typical of dense urban environments.

Whilst little can be done at detailed design stage to increase the sunlight availability to the facades, it is recommended that living areas are located in the areas of greatest sunlight potential and, where possible, have a southerly aspect. Should living rooms be located in some of the areas of lower sunlight potential, they should be designed as dual aspect to allow for greater access to sunlight.

In addition, as explained above for the daylight ingress, balconies reduce the sunlight reaching the windows below (if projecting) or behind them (if recessed). This is particularly relevant as balconies are generally located in front of living areas, where sunlight is regarded as most important. Special consideration is therefore required in the balcony strategy, to maximise the amount of sunlight reaching the living room windows. This can be achieved by staggering the balconies and/or internal layouts, or

ensuring that additional windows free of obstructions are provided within each dwelling.

Overall, the proposed development has the potential to offer good daylight and sunlight amenity within the residential units, provided care is taken at detailed design stage.

Overshadowing

The BRE Guidelines recommend that, in order for an outdoor space to be well sunlit throughout the year, at least 50% of its area should receive direct sunlight for two hours or more on 21st March. The public realm, courtyard and podium spaces have therefore been assessed against this criterion. Moreover, in order to better understand the levels of sunlight throughout the year, additional assessments of sunlight exposure on 21st March and 21st June have been undertaken.

A variety of open spaces are provided within the Site, including a large ground-floor public realm and a number of communal areas located at ground and podium levels.

The canopy above the Wintergardens has not been taken into account within the assessment, as the sunlight availability will depend on its detailed design and materials.

The public realm (Areas 1 and 2) comprises generously-sized public amenity areas which well exceed the minimum recommendation for sunlight, with 82% of each space seeing at least two hours of direct sunlight on the equinox. As such, future users will be able to enjoy good levels of sunlight within the public realm throughout the year.

As can be expected, direct sunlight levels in mid-season tend to be lower to the immediate north of buildings and within courtyards, as the massing intercepts the low-angle sunlight typical of this period of the year.

Where buildings are arranged around courtyards open to the north, south-facing podium-level areas provide good levels of sunlight which can compensate the lower sunlight availability of north-facing ground-level areas (see areas 12 to 17). In the same way, where narrower amenity areas have limited sunlight availability in mid-season, the wider courtyards within the same blocks offer good sunlight levels (see areas 7 to 10). Future occupants of these blocks will therefore be able to enjoy good sunlight levels.

In the summer, the public realm offers excellent levels of sunlight, with the majority of the space receiving direct sunlight for at least six hours on the summer solstice.

The narrower spaces between buildings and

courtyards inevitably receive less sunlight, as is typical of any densely built urban environment. Nevertheless, the great majority of these spaces still receive at least three hours of sunlight on the summer solstice.

Overall therefore, the Site has the potential to offer good sunlight amenity within its outdoor public and communal spaces.

5 SITE OVERVIEW

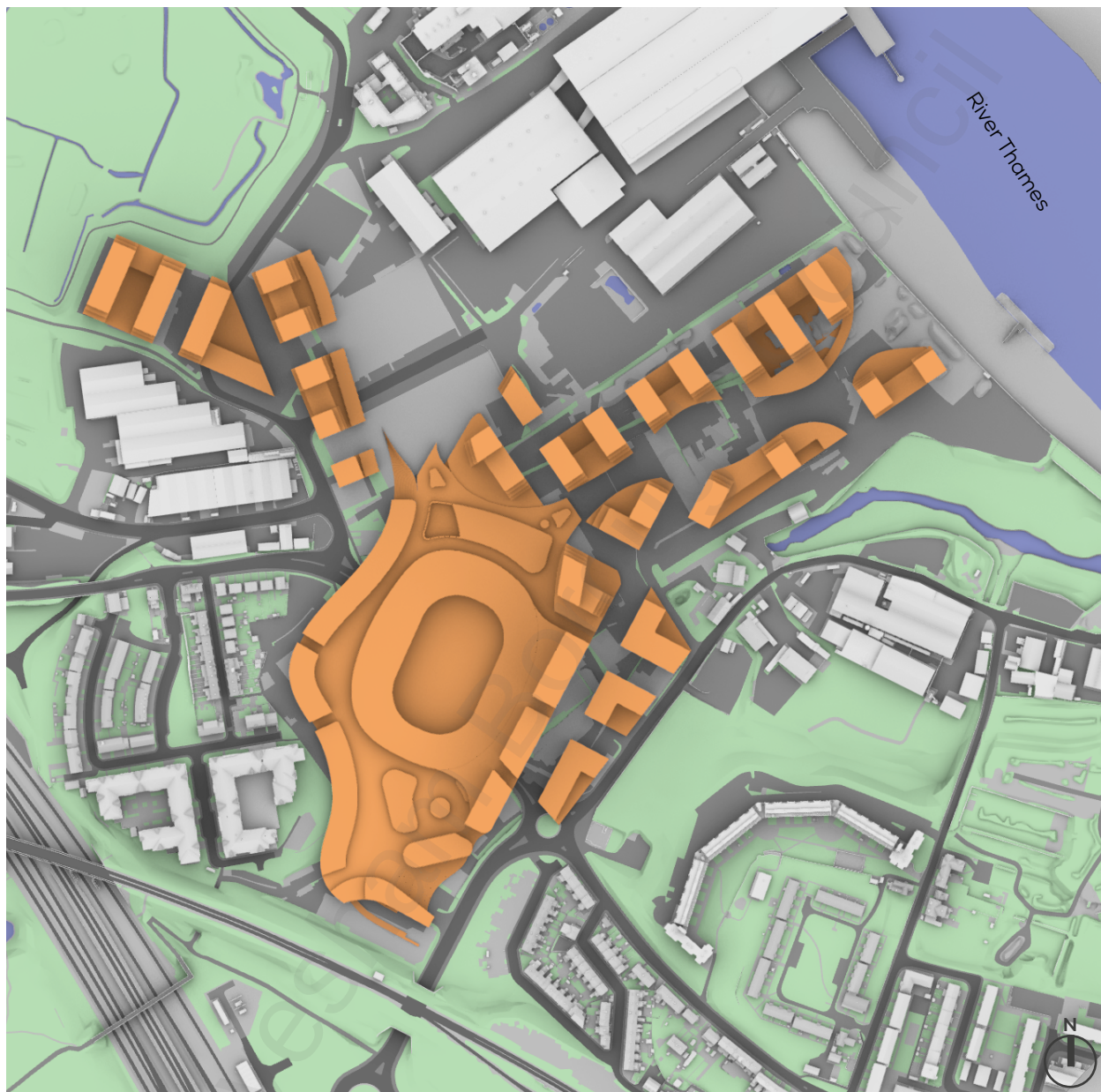


Fig. 01: Top view

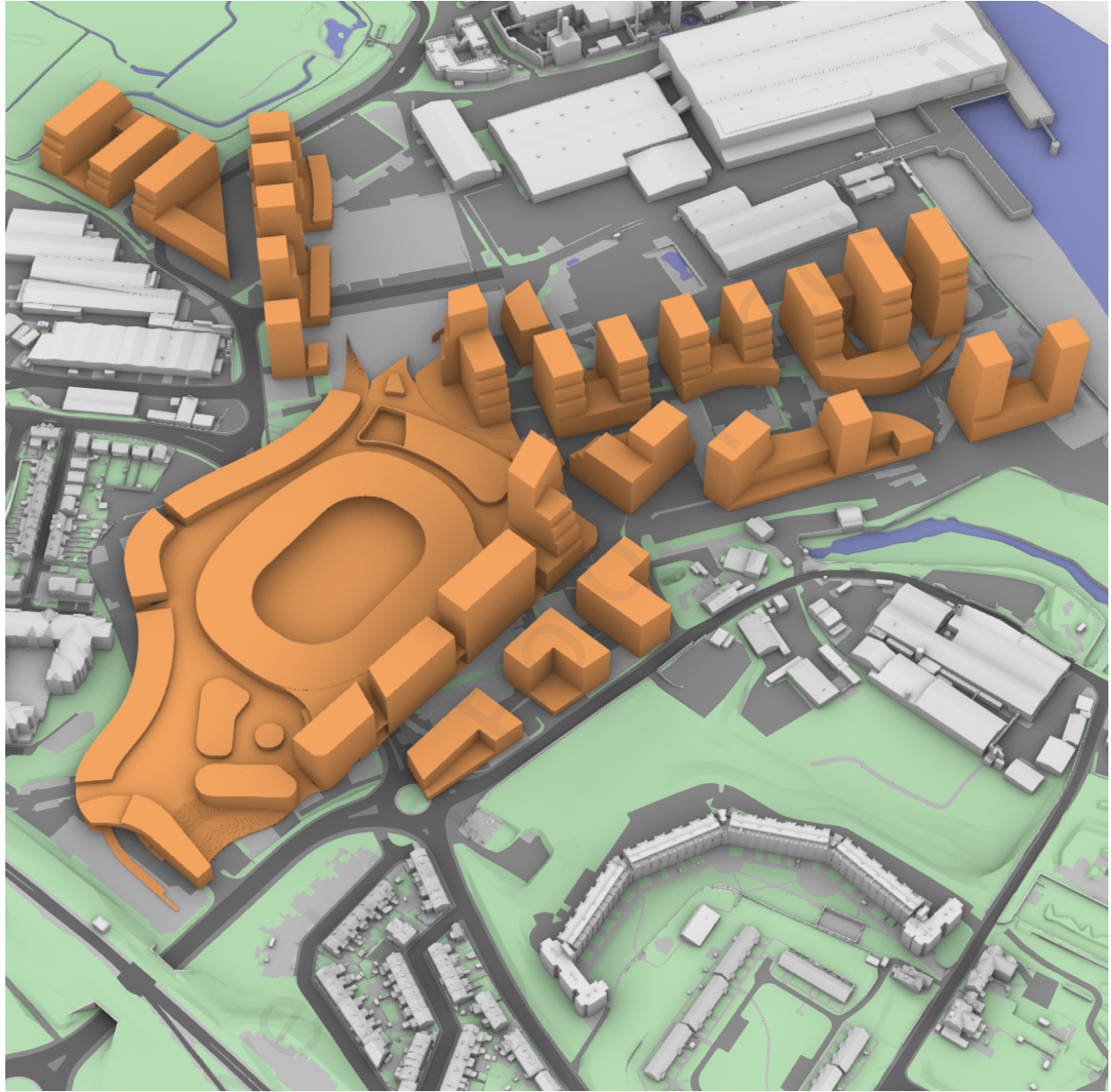


Fig. 02: Perspective view

6 DAYLIGHT POTENTIAL ASSESSMENT

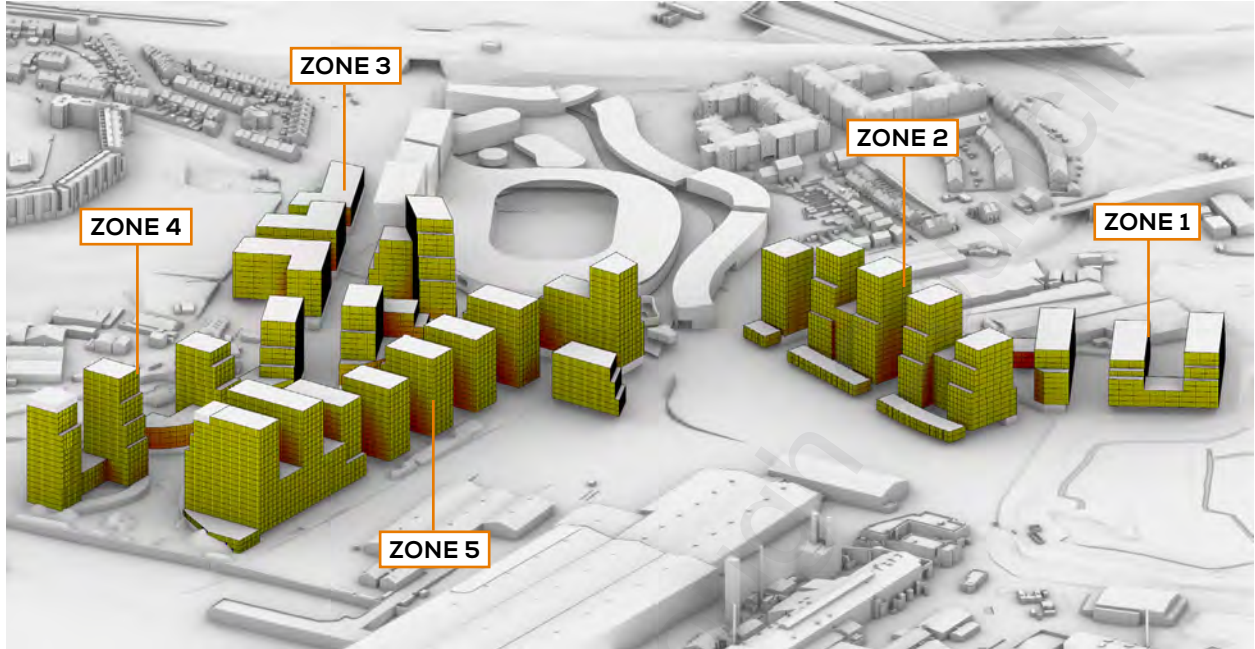
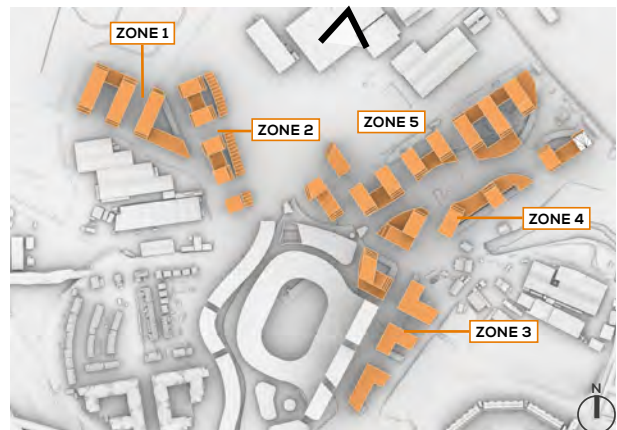
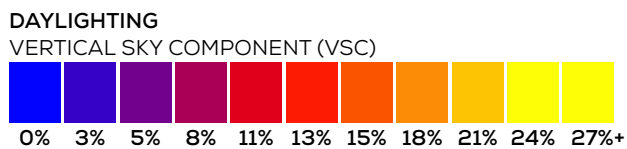


Fig. 03: Daylight Potential - Perspective view



VSC FAÇADE ASSESSMENT
ZONE 1

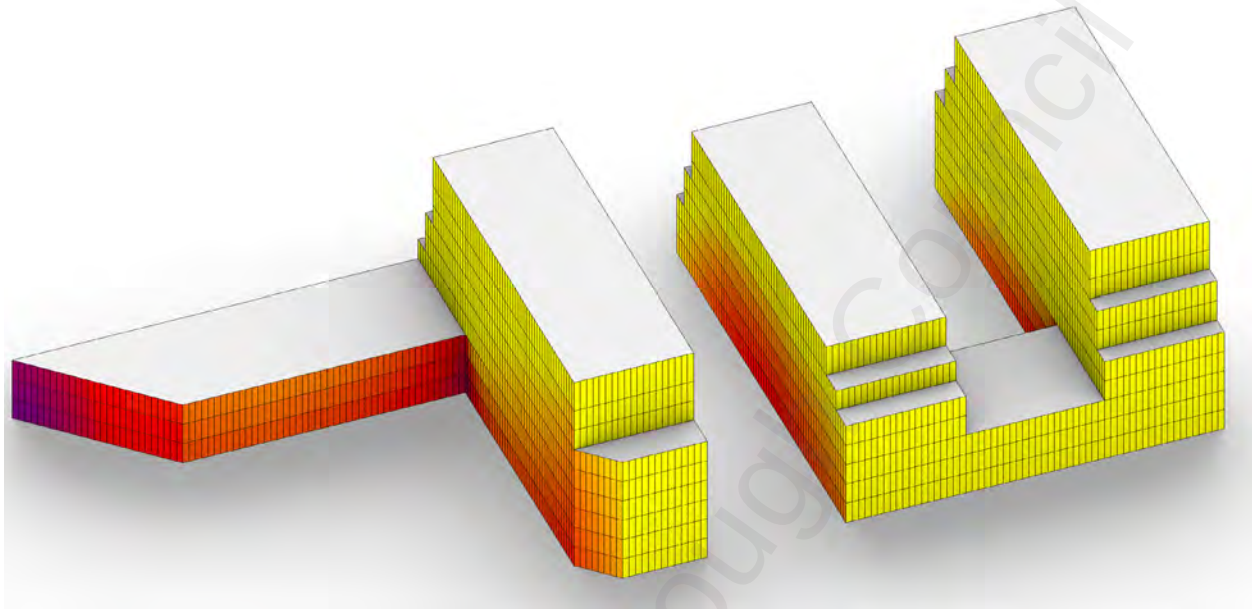
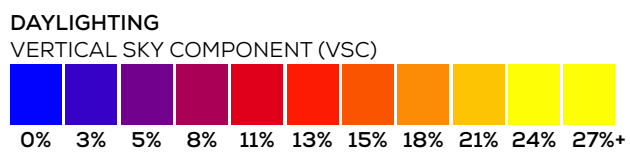


Fig. 04: VSC Diagram



VSC FAÇADE ASSESSMENT
ZONE 1

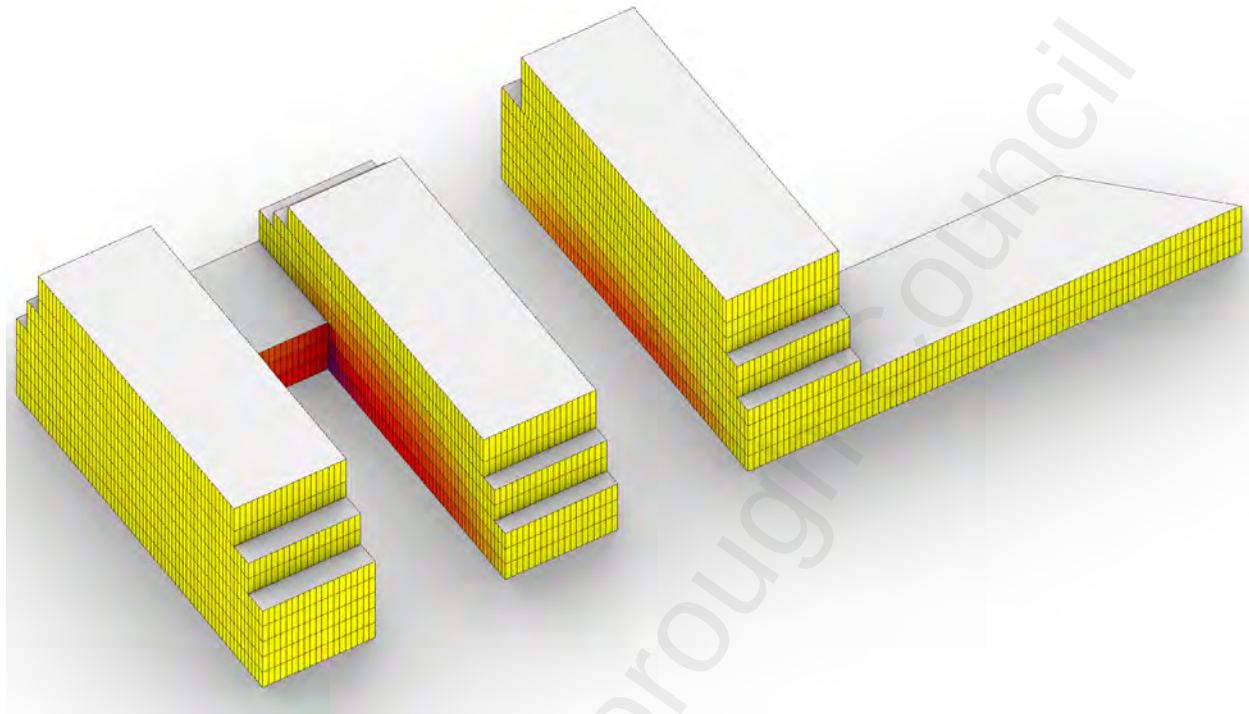
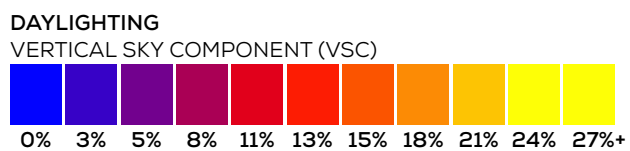


Fig. 05: VSC Diagram



VSC FAÇADE ASSESSMENT
ZONE 2

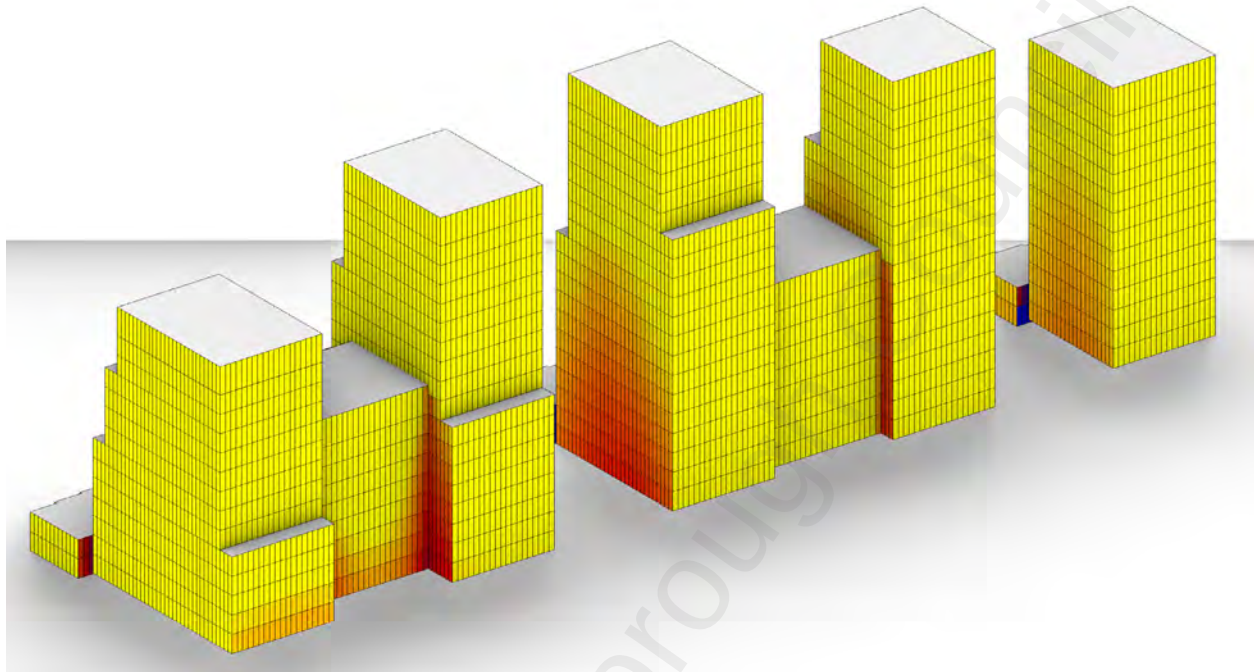
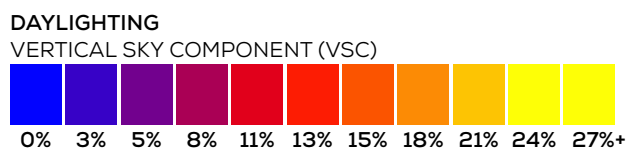


Fig. 06: VSC Diagram



VSC FAÇADE ASSESSMENT
ZONE 2

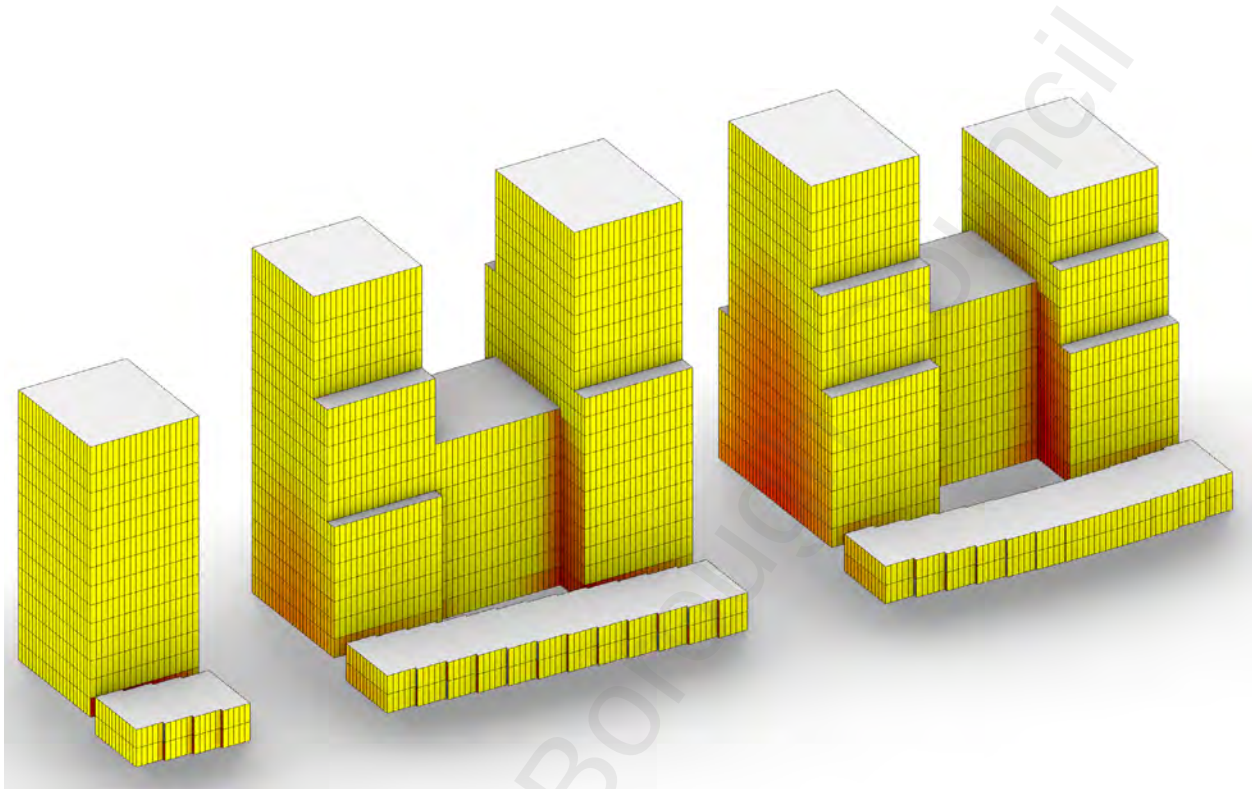
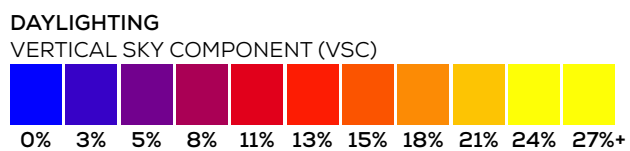


Fig. 07: VSC Diagram



VSC FAÇADE ASSESSMENT
ZONE 3

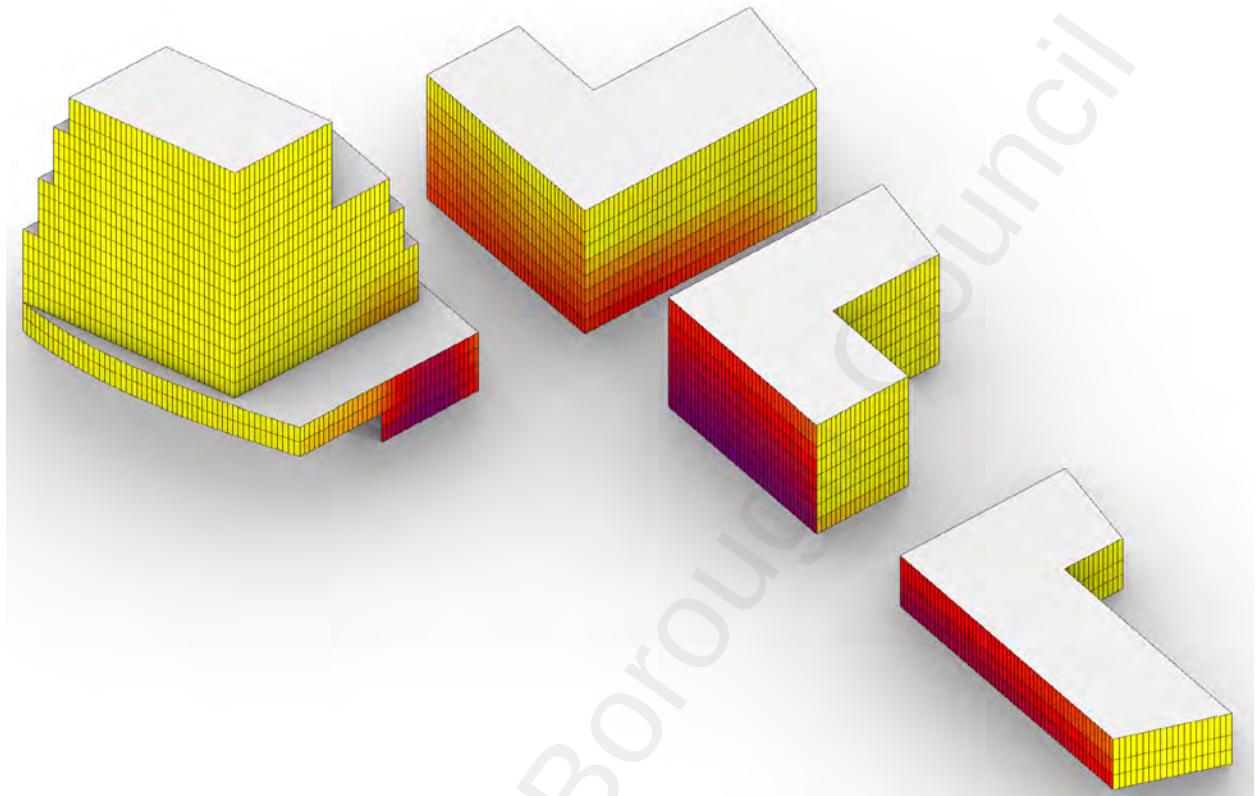
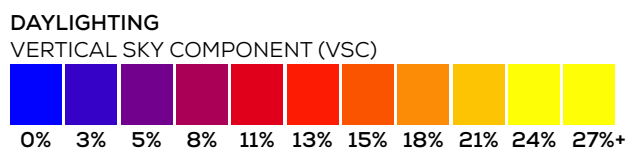


Fig. 08: VSC Diagram



VSC FAÇADE ASSESSMENT
ZONE 3

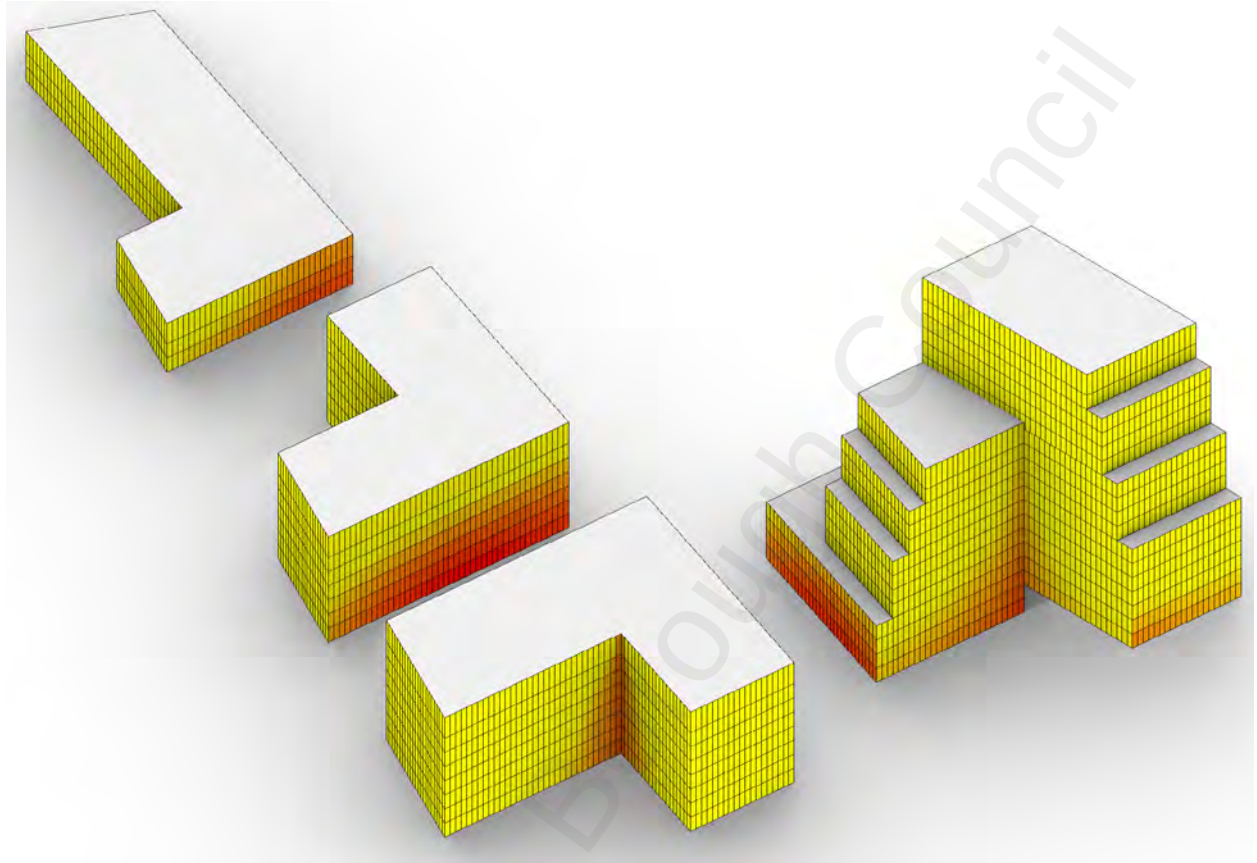
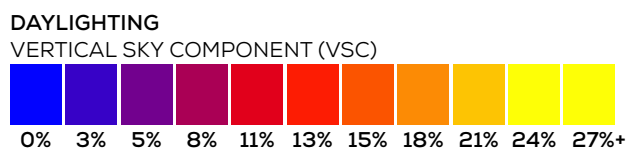


Fig. 09: VSC Diagram



VSC FAÇADE ASSESSMENT
ZONE 4

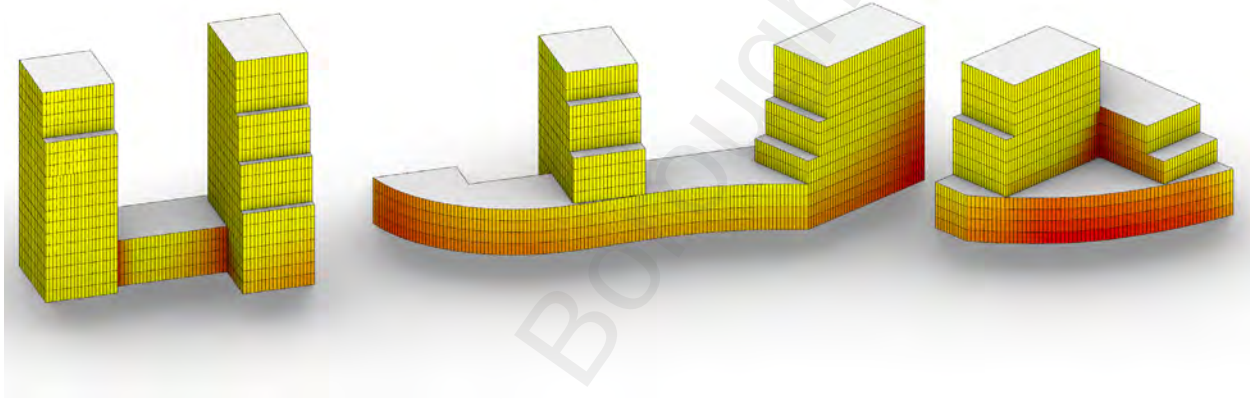
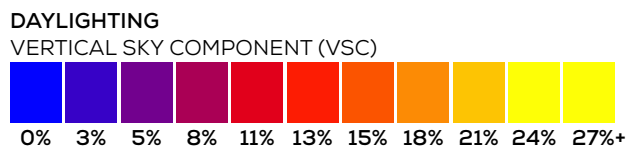


Fig. 10: VSC Diagram



VSC FAÇADE ASSESSMENT
ZONE 4

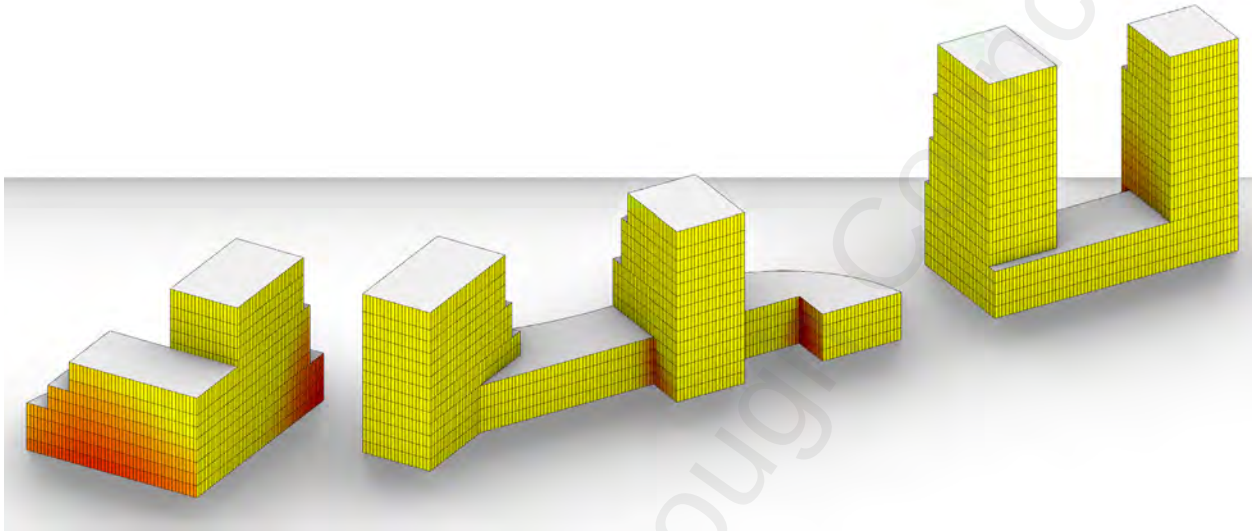
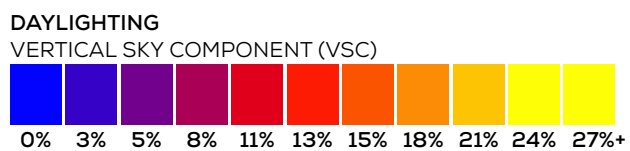


Fig. 11: VSC Diagram



VSC FAÇADE ASSESSMENT
ZONE 5

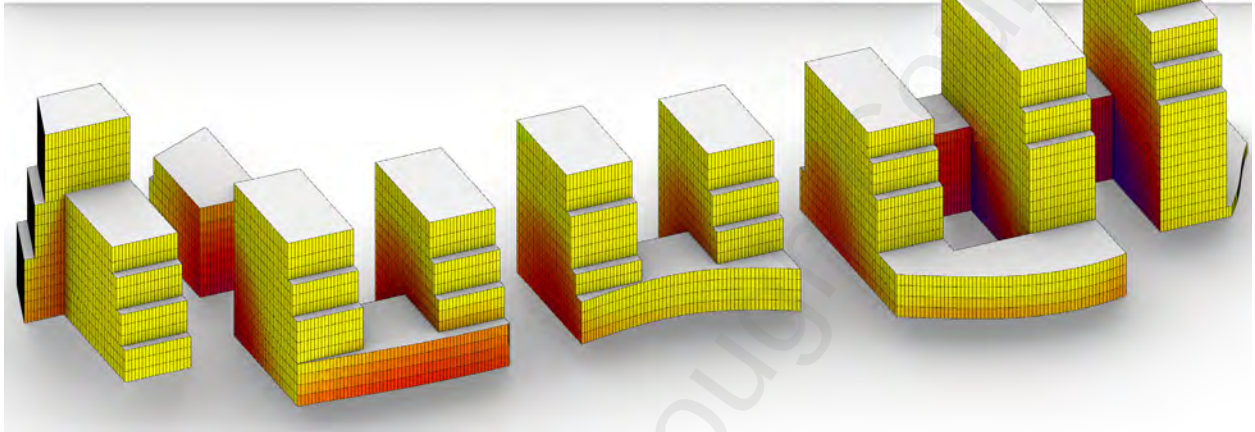
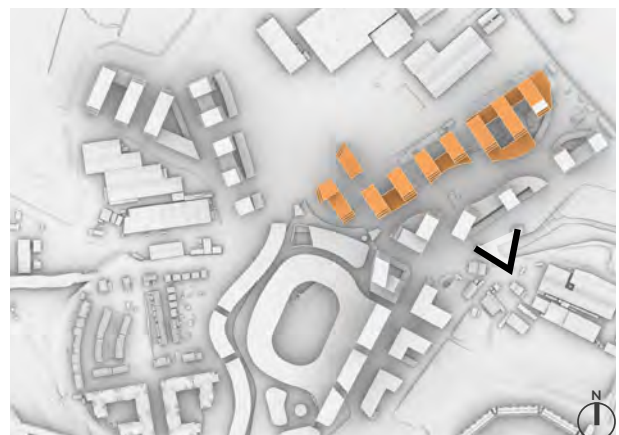
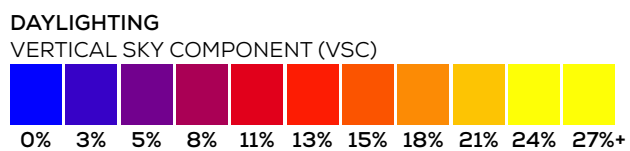


Fig. 12: VSC Diagram



VSC FAÇADE ASSESSMENT
ZONE 5

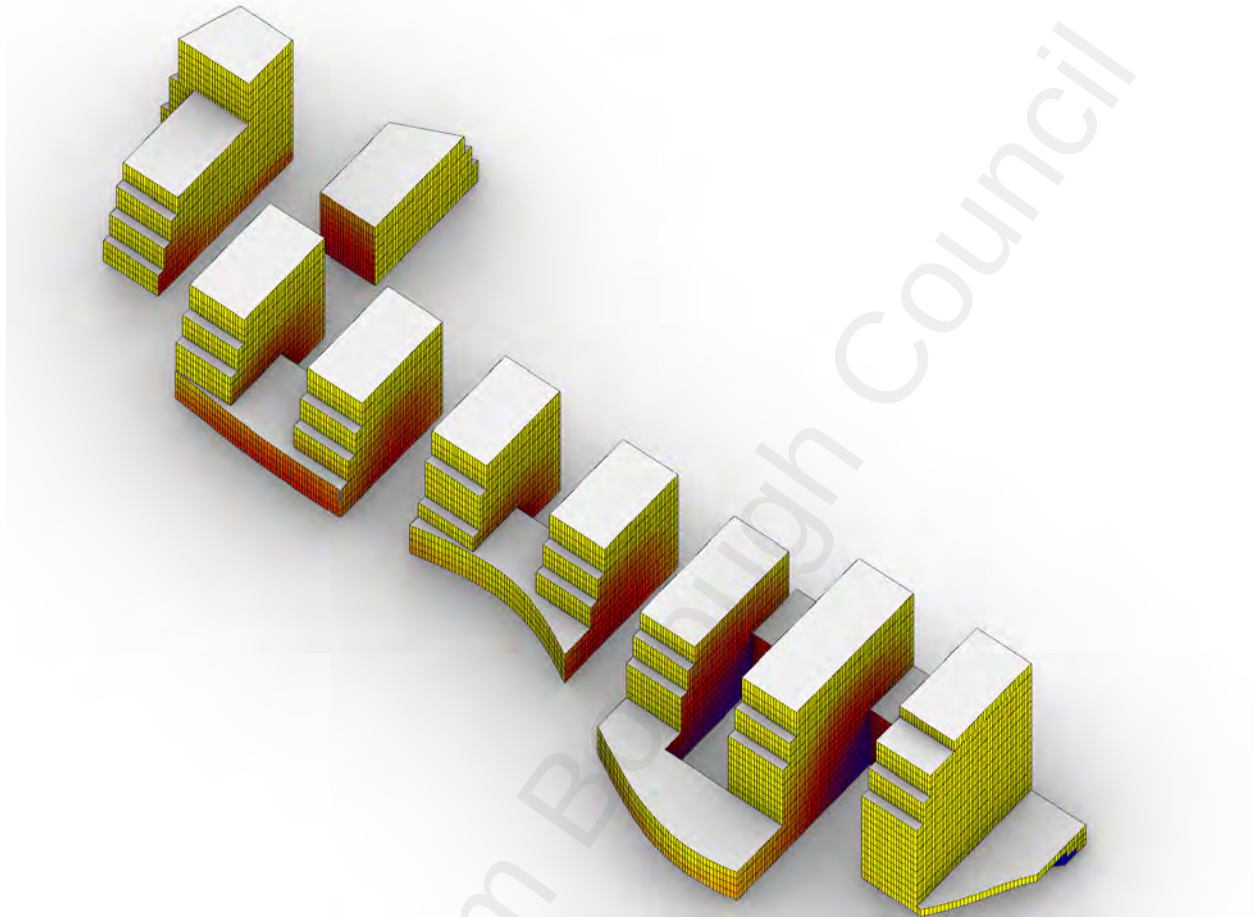
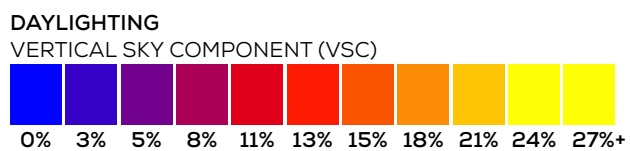


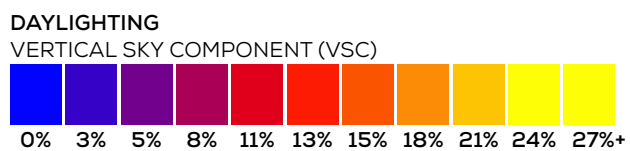
Fig. 13: VSC Diagram



VSC FAÇADE ASSESSMENT
ZONE 5



Fig. 14: VSC Diagram



VSC FAÇADE ASSESSMENT
ZONE 5

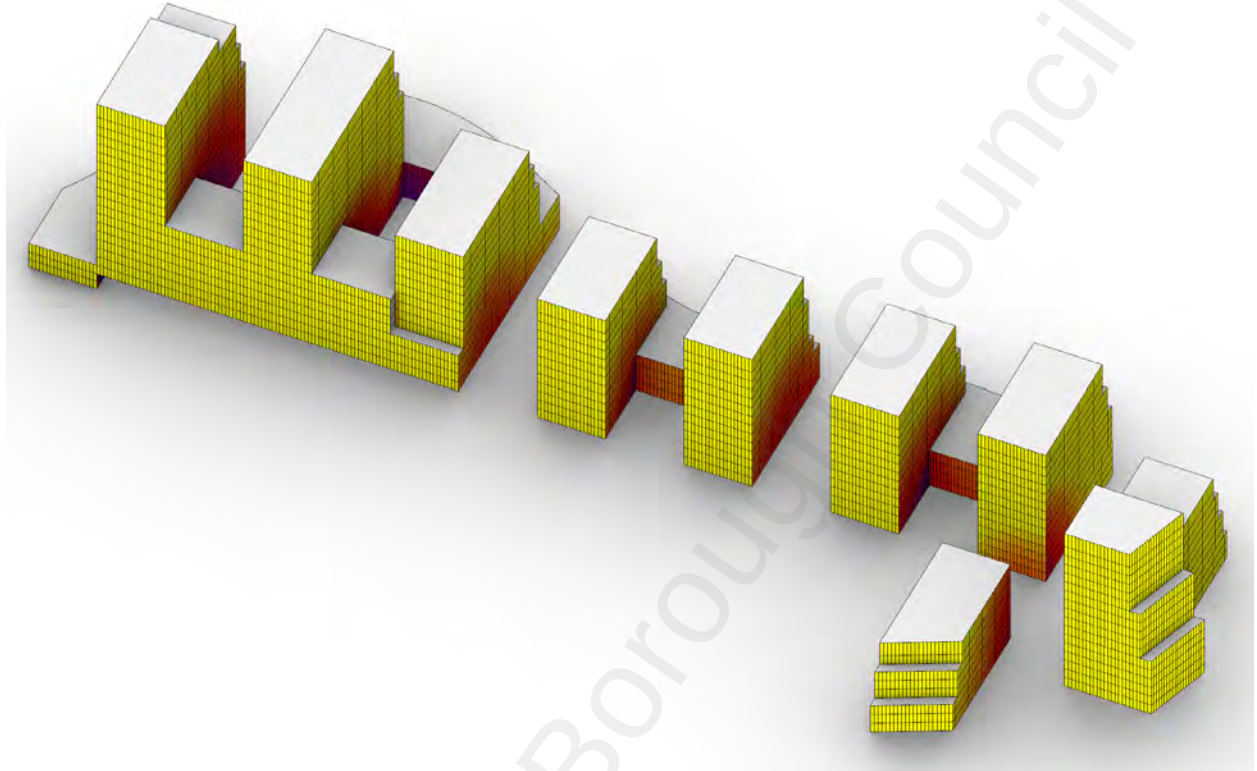
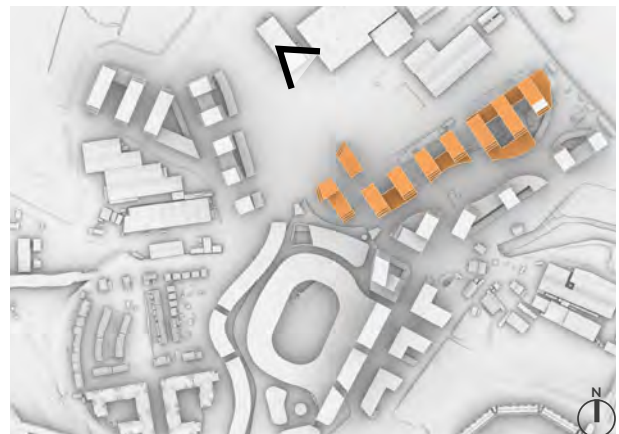
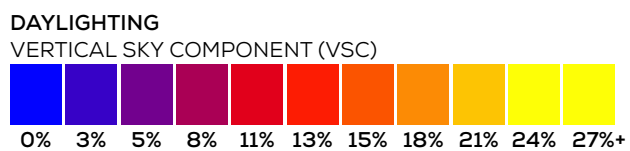


Fig. 15: VSC Diagram



Gravesham Borough Council

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7 SUNLIGHT POTENTIAL ASSESSMENT

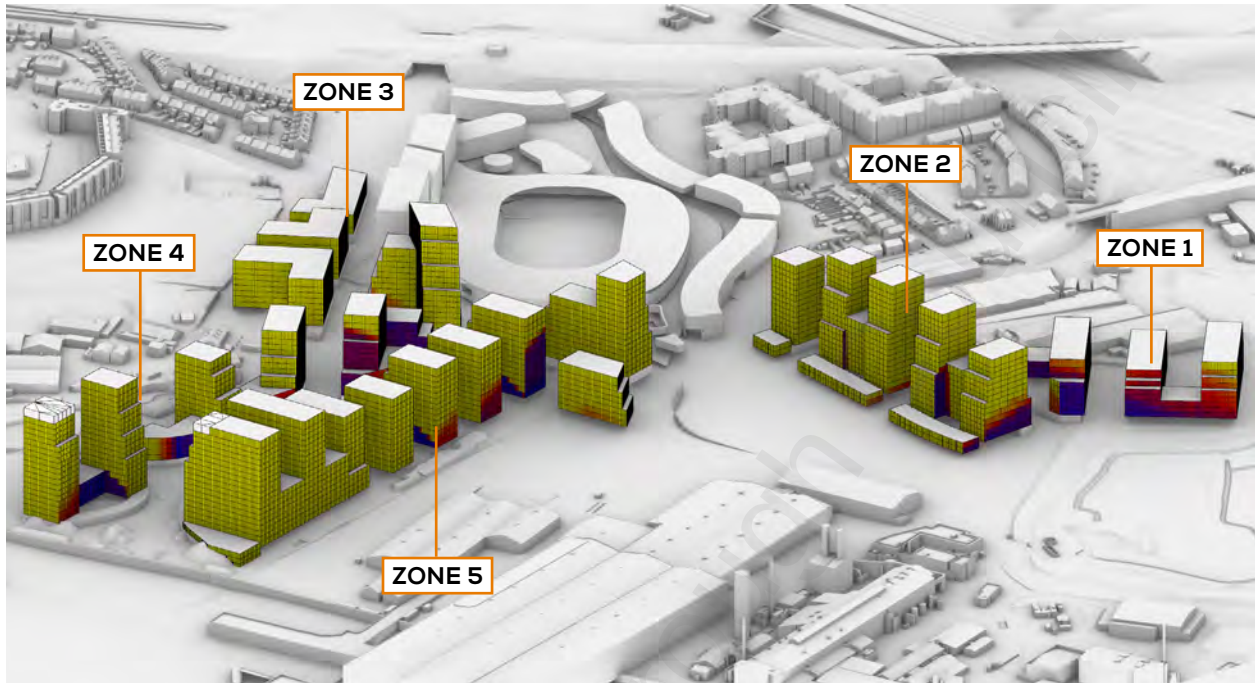
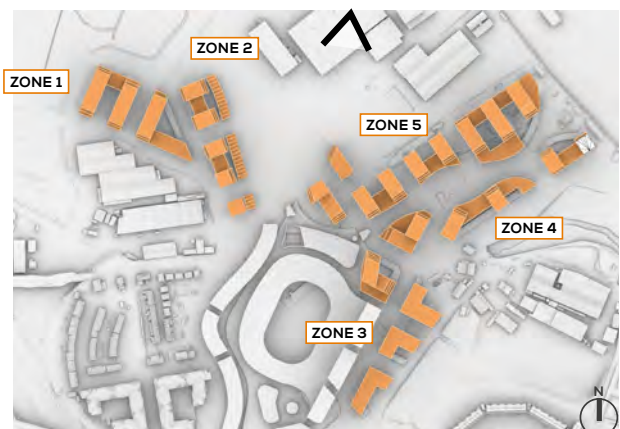
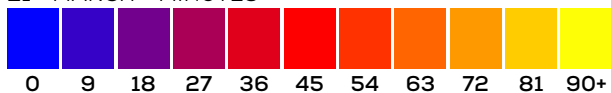


Fig. 16: Sunlight Potential - Perspective view

SUNLIGHTING
21ST MARCH - MINUTES



ENSOX FAÇADE ASSESSMENT
ZONE 1

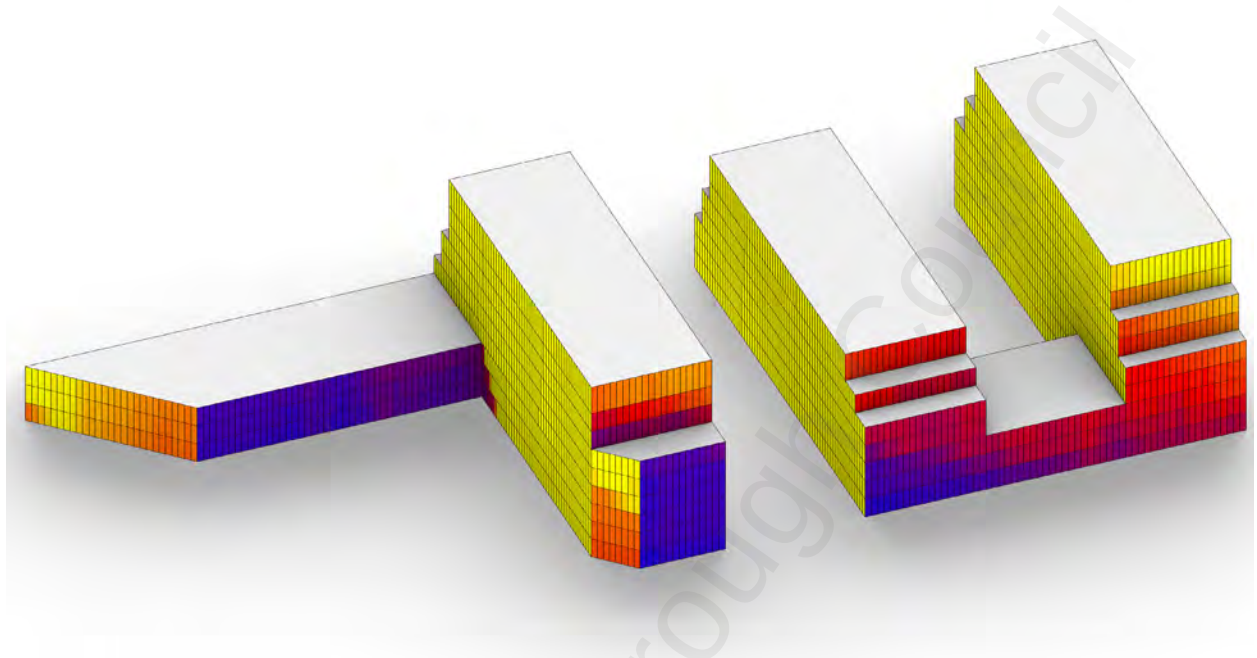
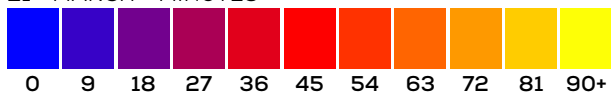


Fig. 17: ENSOX Diagram

SUNLIGHTING
21ST MARCH - MINUTES



ENSOX FAÇADE ASSESSMENT
ZONE 1

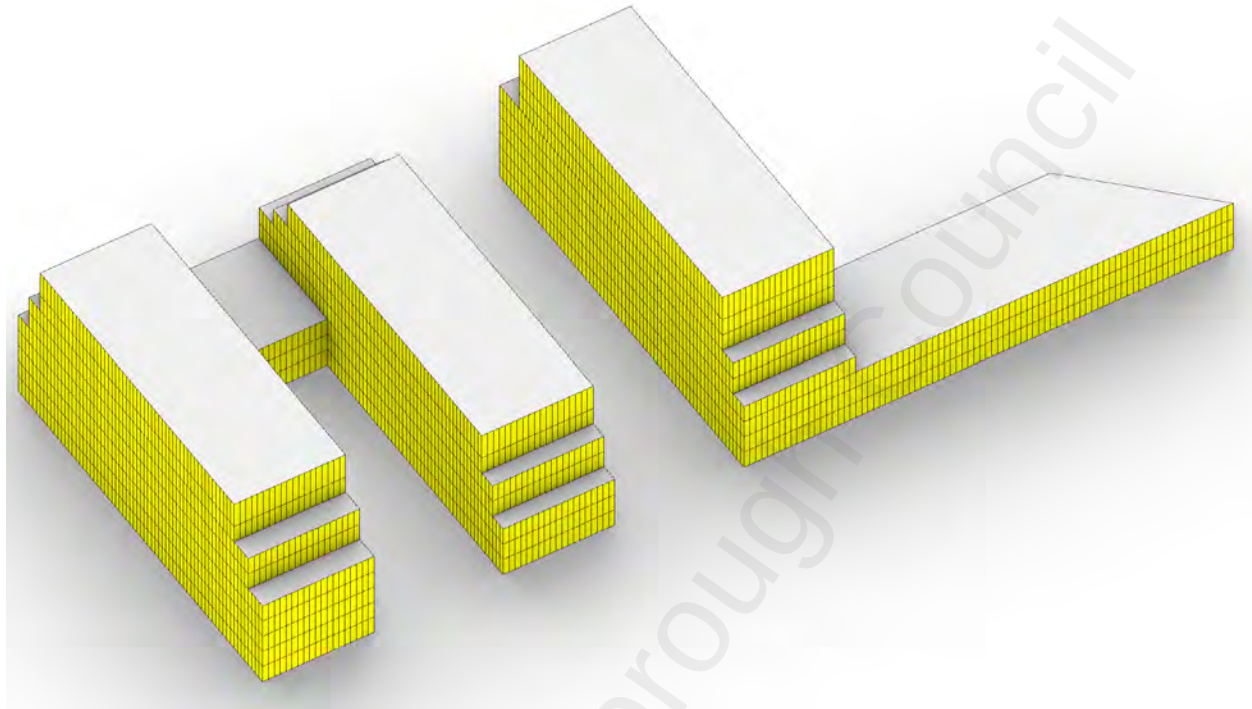
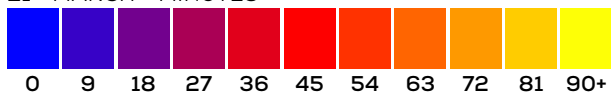


Fig. 18: ENSOX Diagram

SUNLIGHTING
21ST MARCH - MINUTES



ENSOX FAÇADE ASSESSMENT
ZONE 2

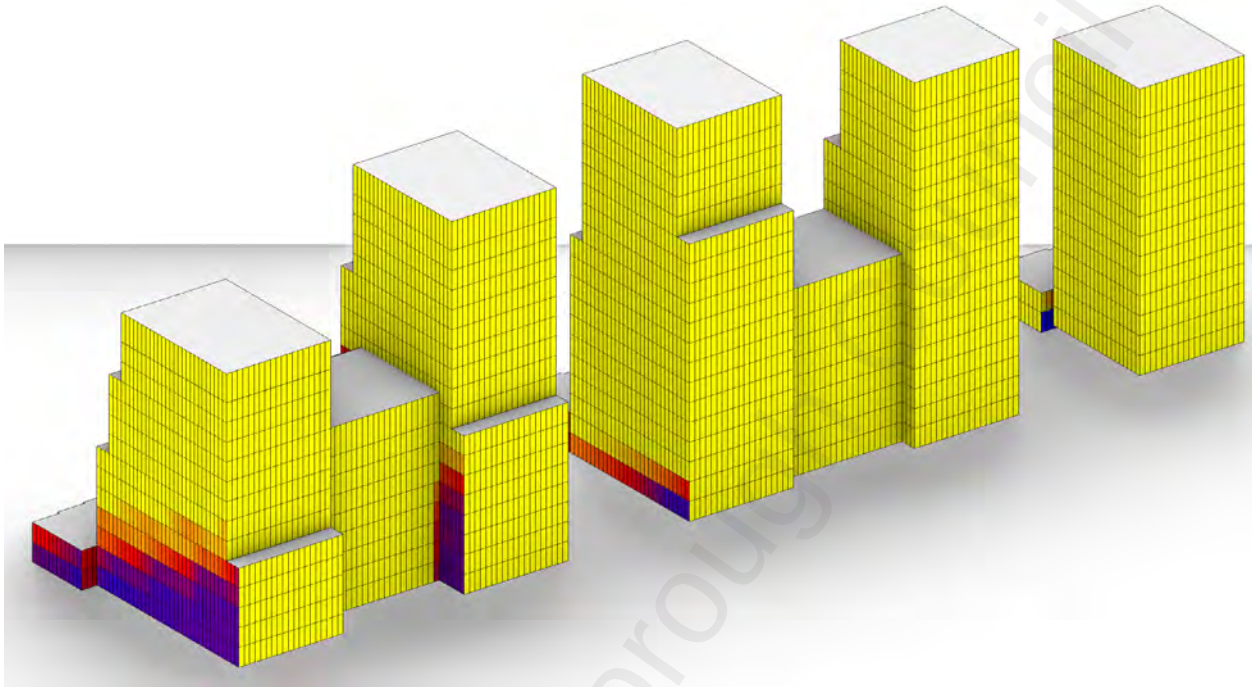
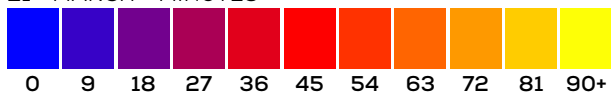


Fig. 19: ENSOX Diagram

SUNLIGHTING
21ST MARCH - MINUTES



ENSOX FAÇADE ASSESSMENT
ZONE 2

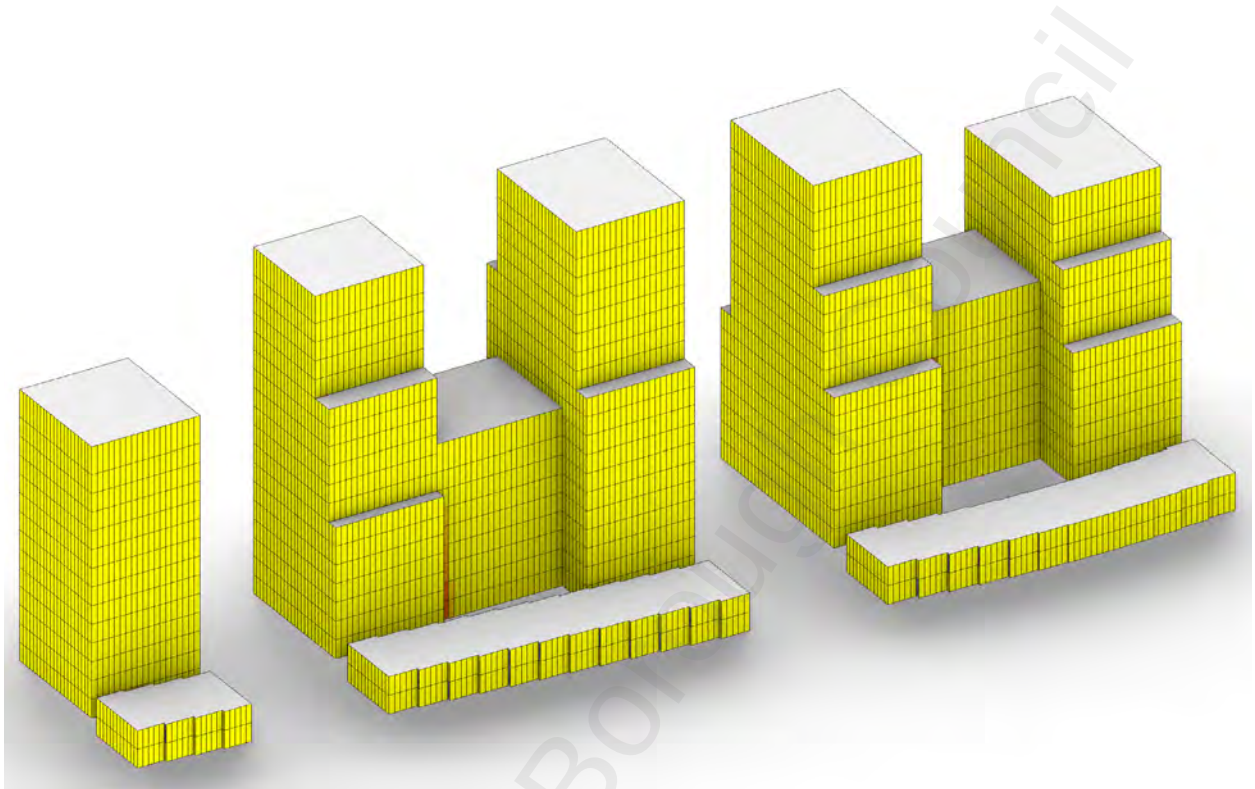
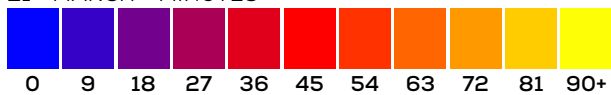


Fig. 20: ENSOX Diagram

SUNLIGHTING
21ST MARCH - MINUTES



ENSOX FAÇADE ASSESSMENT
ZONE 3

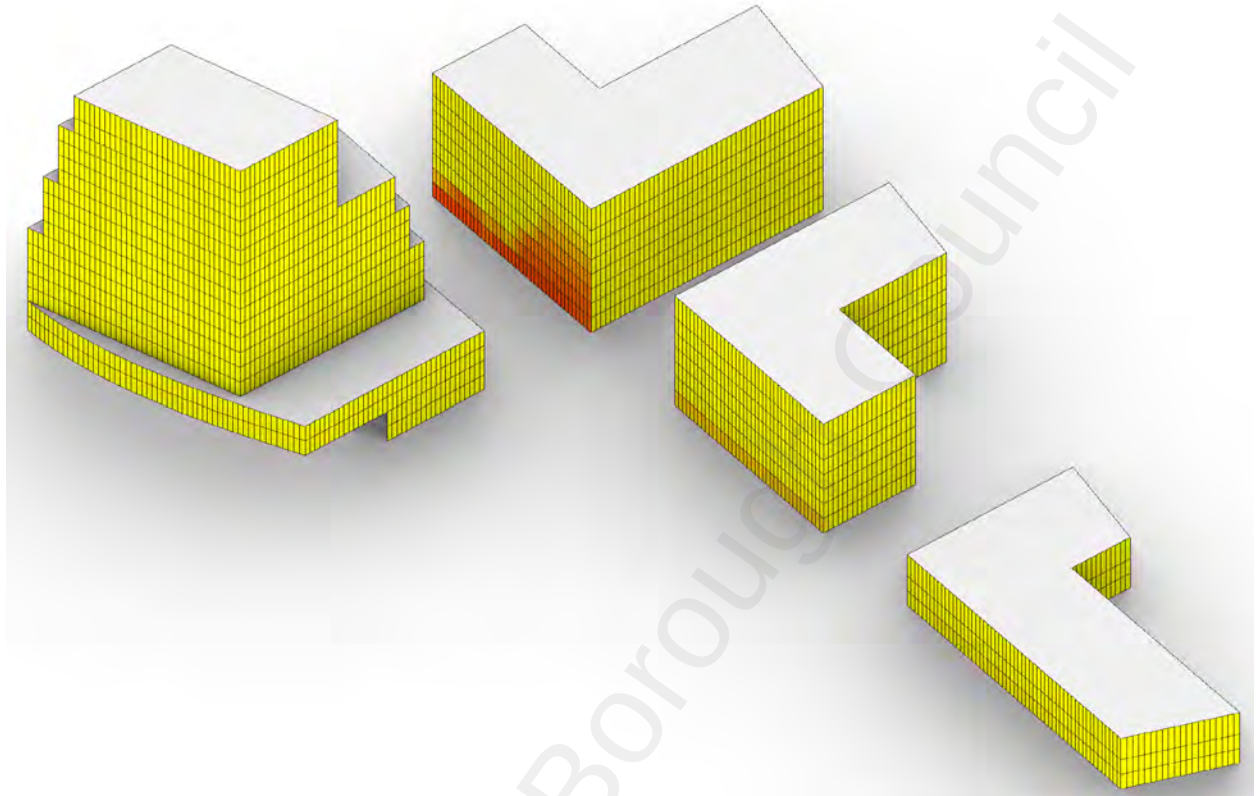
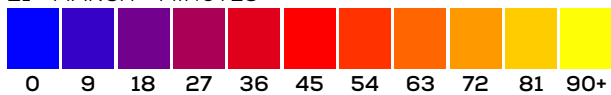


Fig. 21: ENSOX Diagram

SUNLIGHTING
21ST MARCH - MINUTES



ENSOX FAÇADE ASSESSMENT
ZONE 3

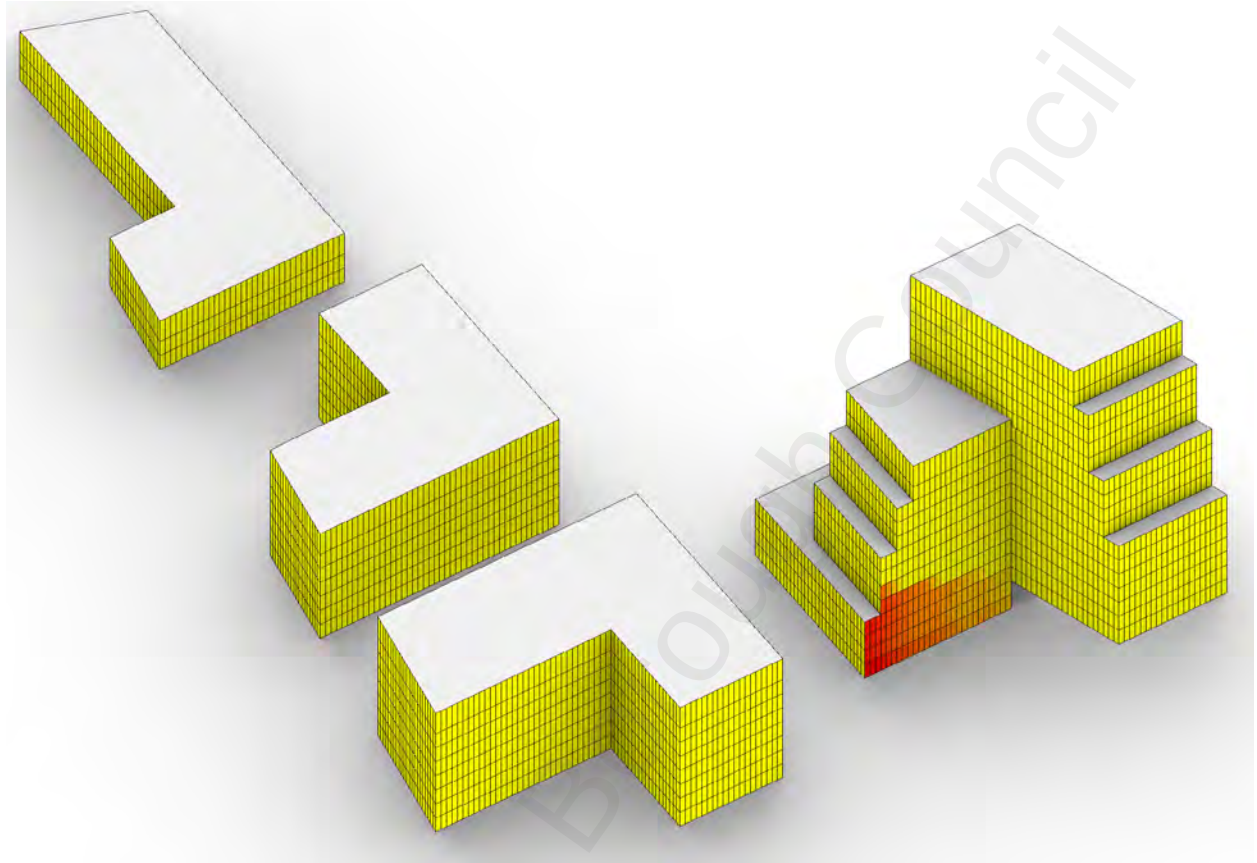
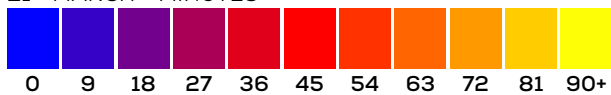


Fig. 22: ENSOX Diagram

SUNLIGHTING
21ST MARCH - MINUTES



ENSOX FAÇADE ASSESSMENT
ZONE 4

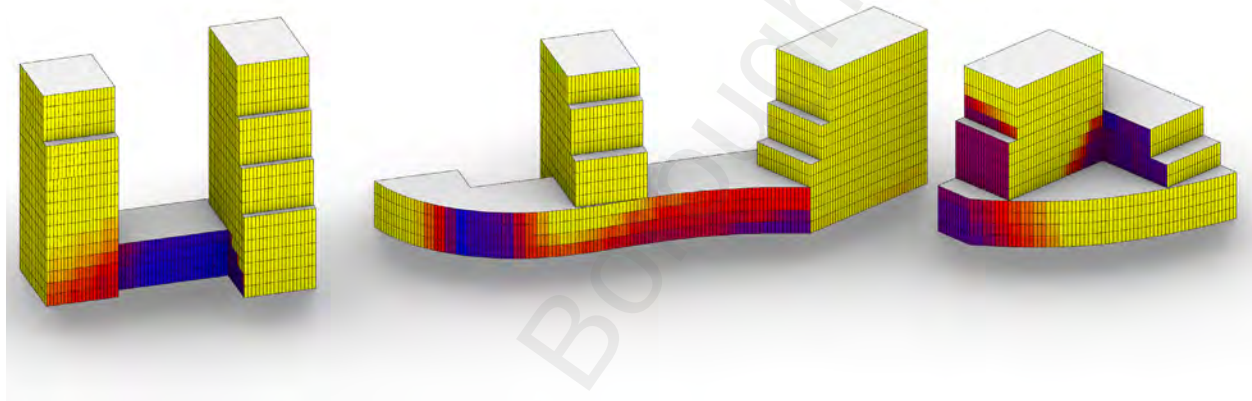


Fig. 23: ENSOX Diagram

SUNLIGHTING
21ST MARCH - MINUTES



ENSOX FAÇADE ASSESSMENT
ZONE 4

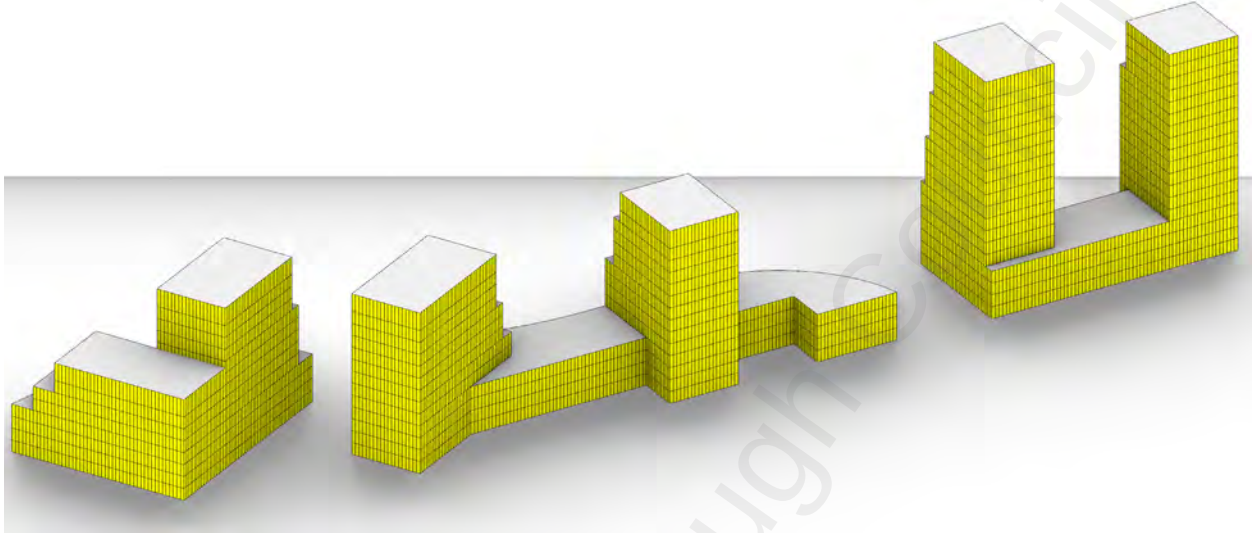
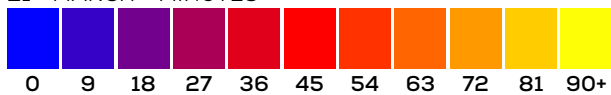


Fig. 24: ENSOX Diagram

SUNLIGHTING
21ST MARCH - MINUTES



ENSOX FAÇADE ASSESSMENT
ZONE 5

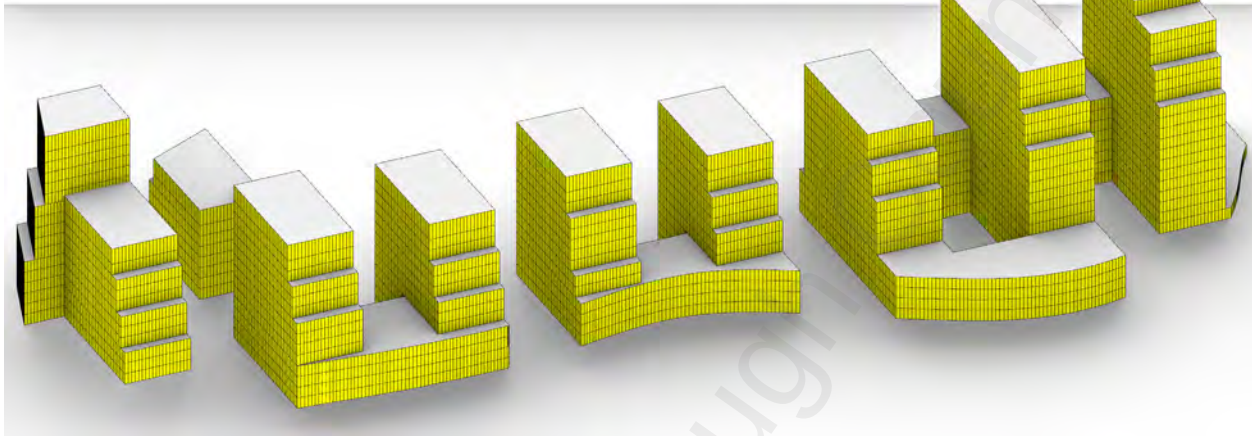
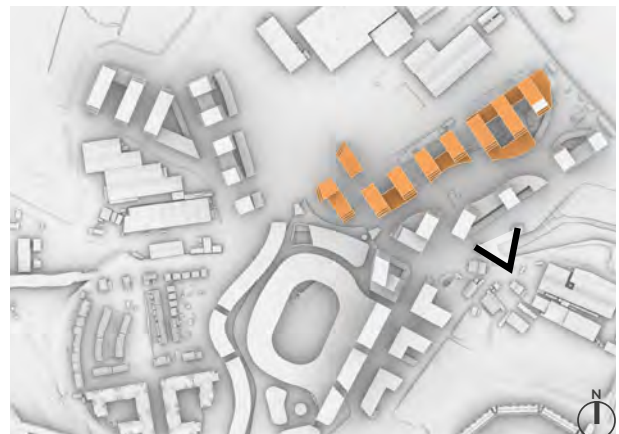
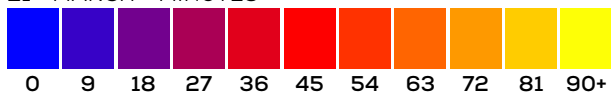


Fig. 25: ENSOX Diagram

SUNLIGHTING
21ST MARCH - MINUTES



ENSOX FAÇADE ASSESSMENT
ZONE 5

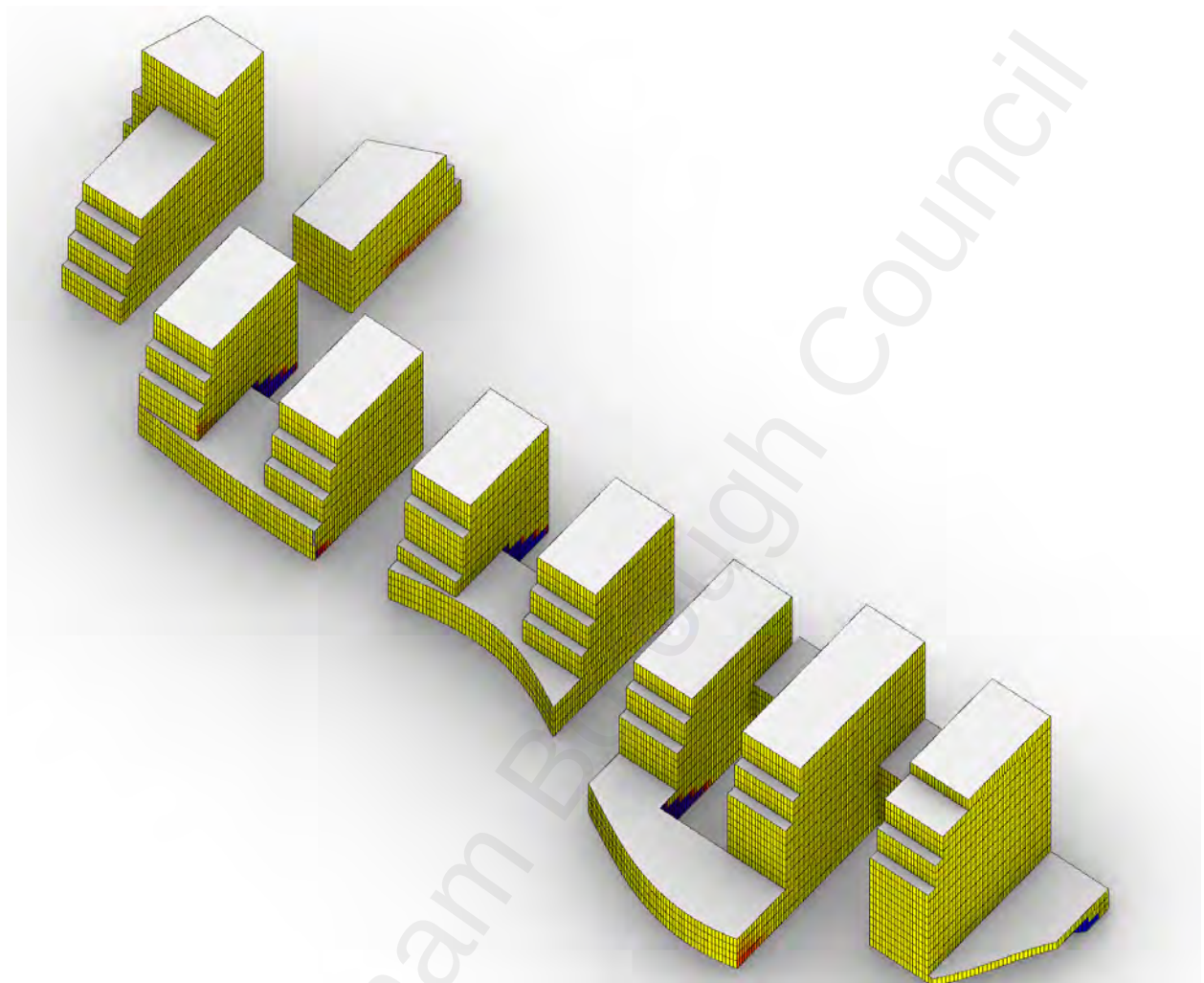
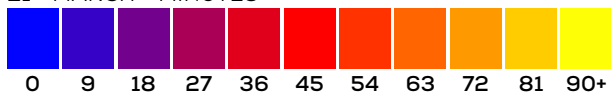


Fig. 26: ENSOX Diagram

SUNLIGHTING
21ST MARCH - MINUTES



ENSOX FAÇADE ASSESSMENT
ZONE 5

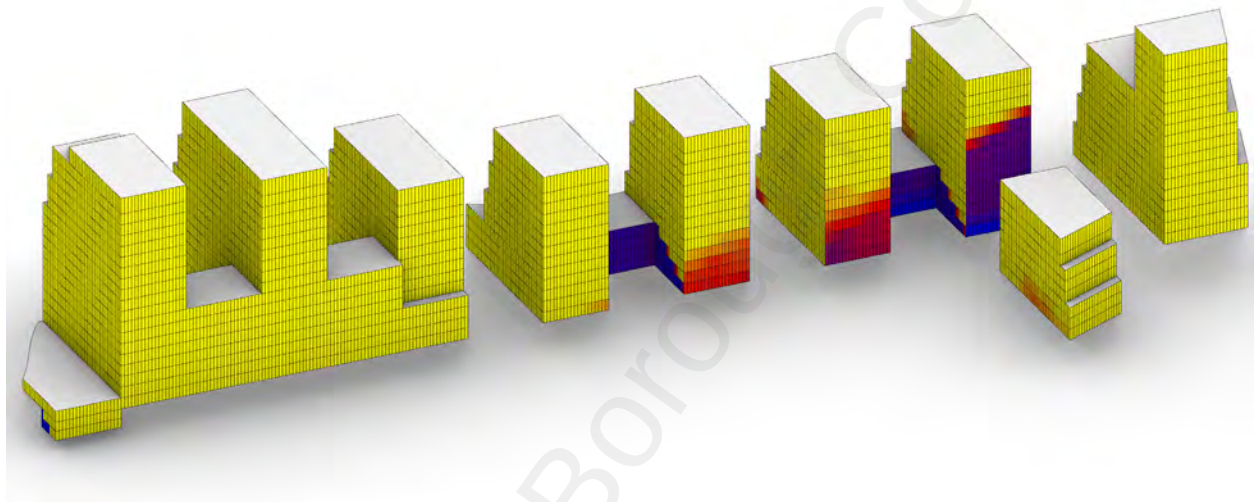
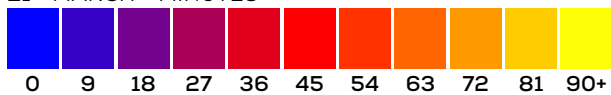


Fig. 27: ENSOX Diagram

SUNLIGHTING
21ST MARCH - MINUTES



ENSOX FAÇADE ASSESSMENT
ZONE 5

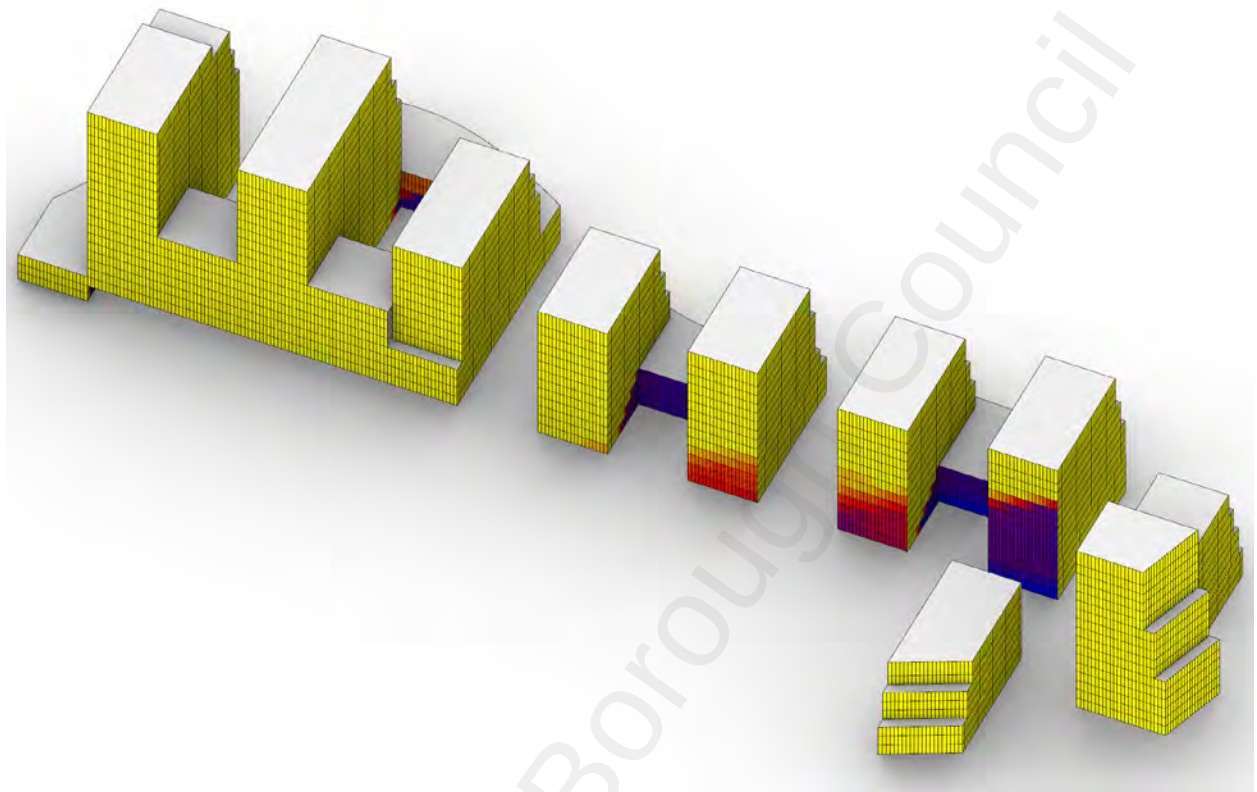
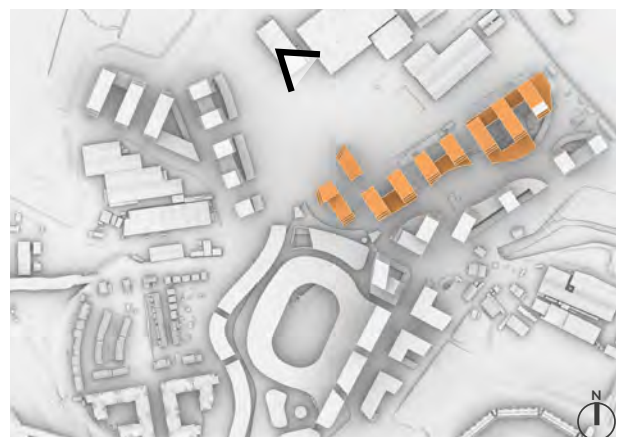
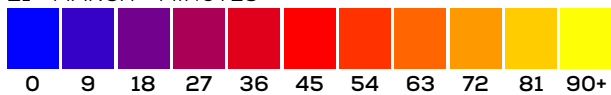


Fig. 28: ENSOX Diagram

SUNLIGHTING
21ST MARCH - MINUTES

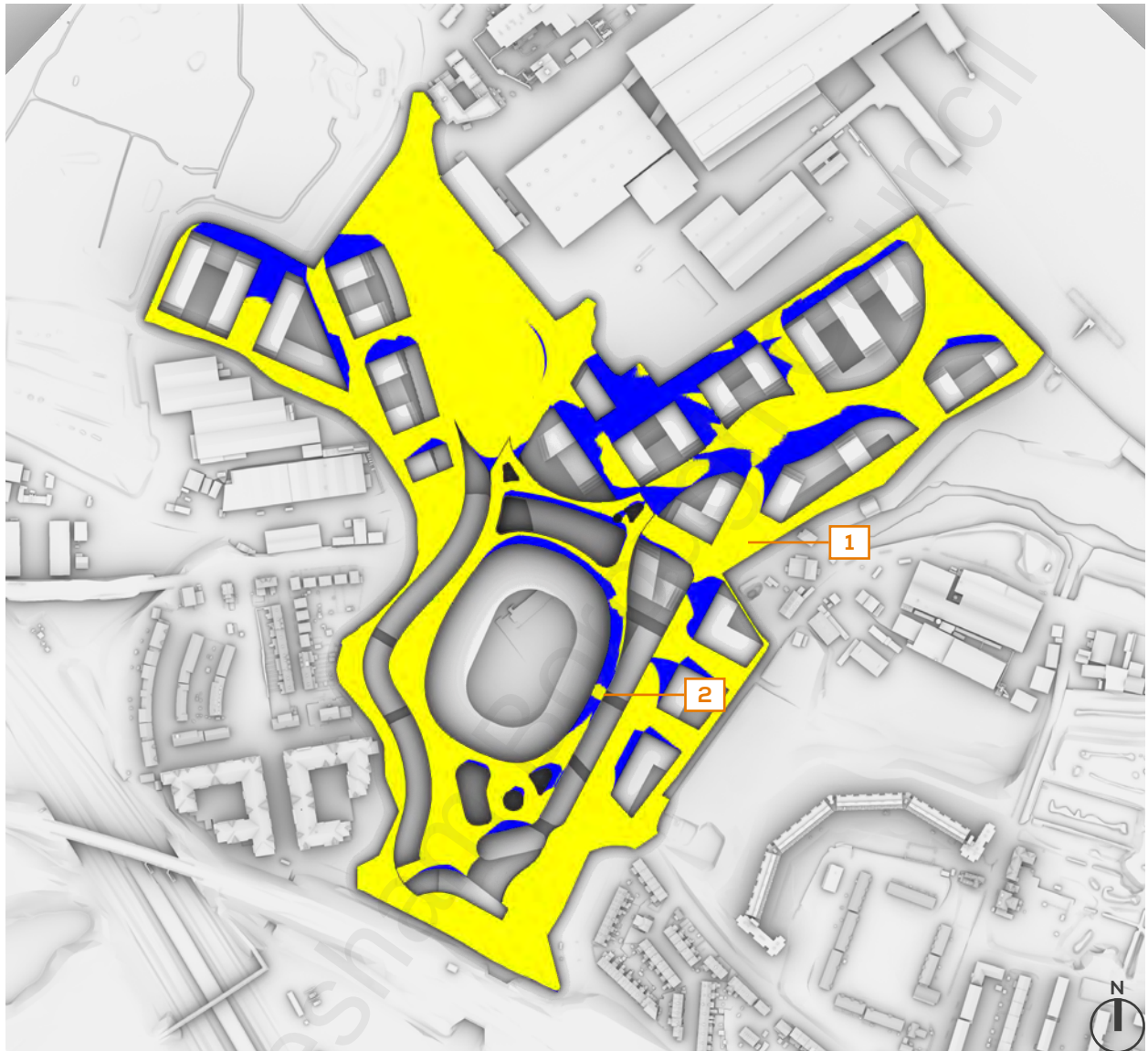


Gravesham Borough Council

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8 OVERSHADOWING ASSESSMENTS

OVERSHADOWING ASSESSMENT - PUBLIC REALM SUN HOURS ON GROUND - BRE TEST



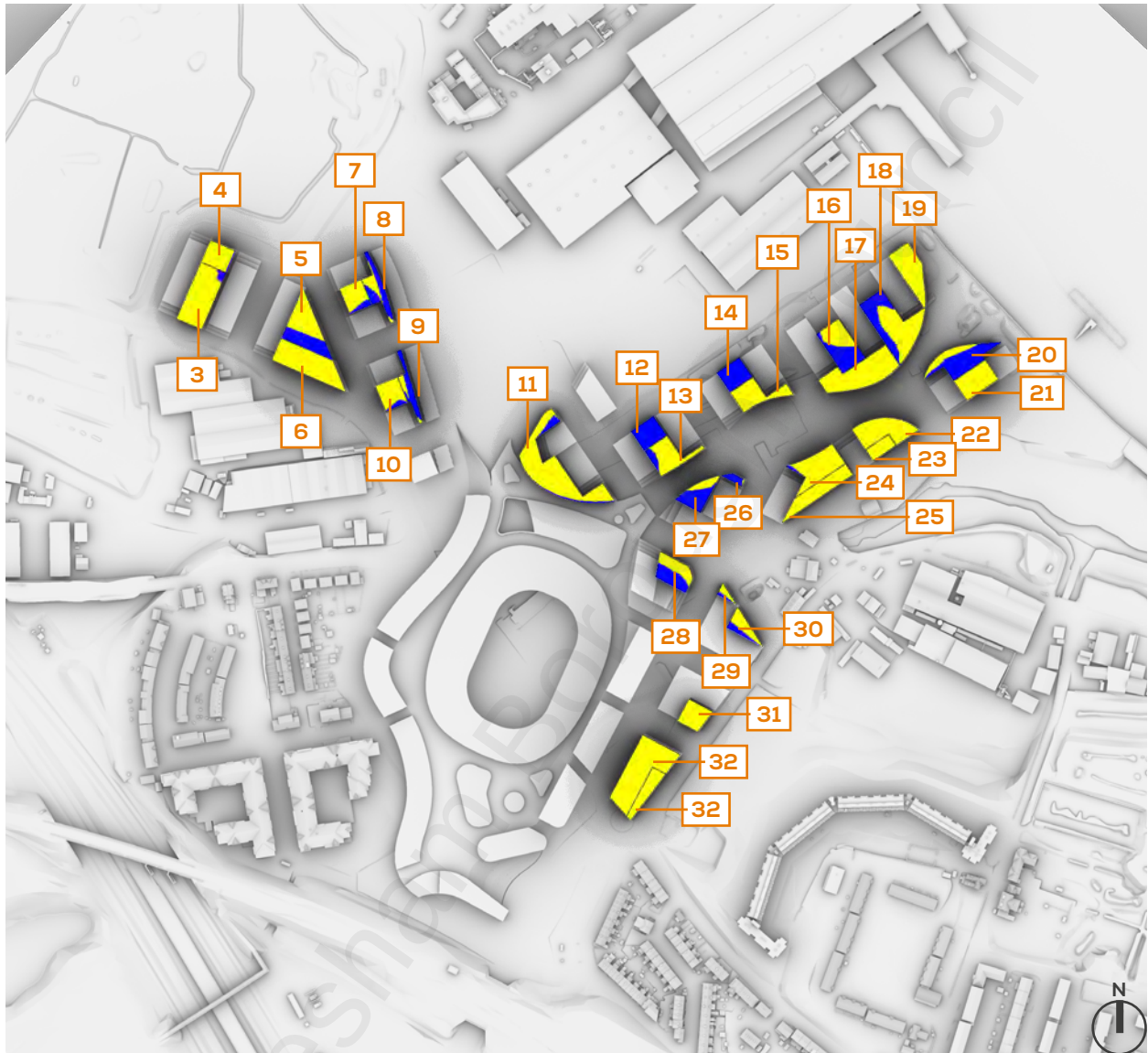
(BRE RECOMMENDS 2+ HOURS OF SUNLIGHT ON 21ST MARCH FOR AT LEAST 50% OF THE OPEN SPACE)

AREA	1	2
% 2+ h	82	82

SUN HOURS ON GROUND
BRE TEST - 21ST MARCH



OVERSHADOWING ASSESSMENT - COMMUNAL AREAS
SUN HOURS ON GROUND - BRE TEST



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

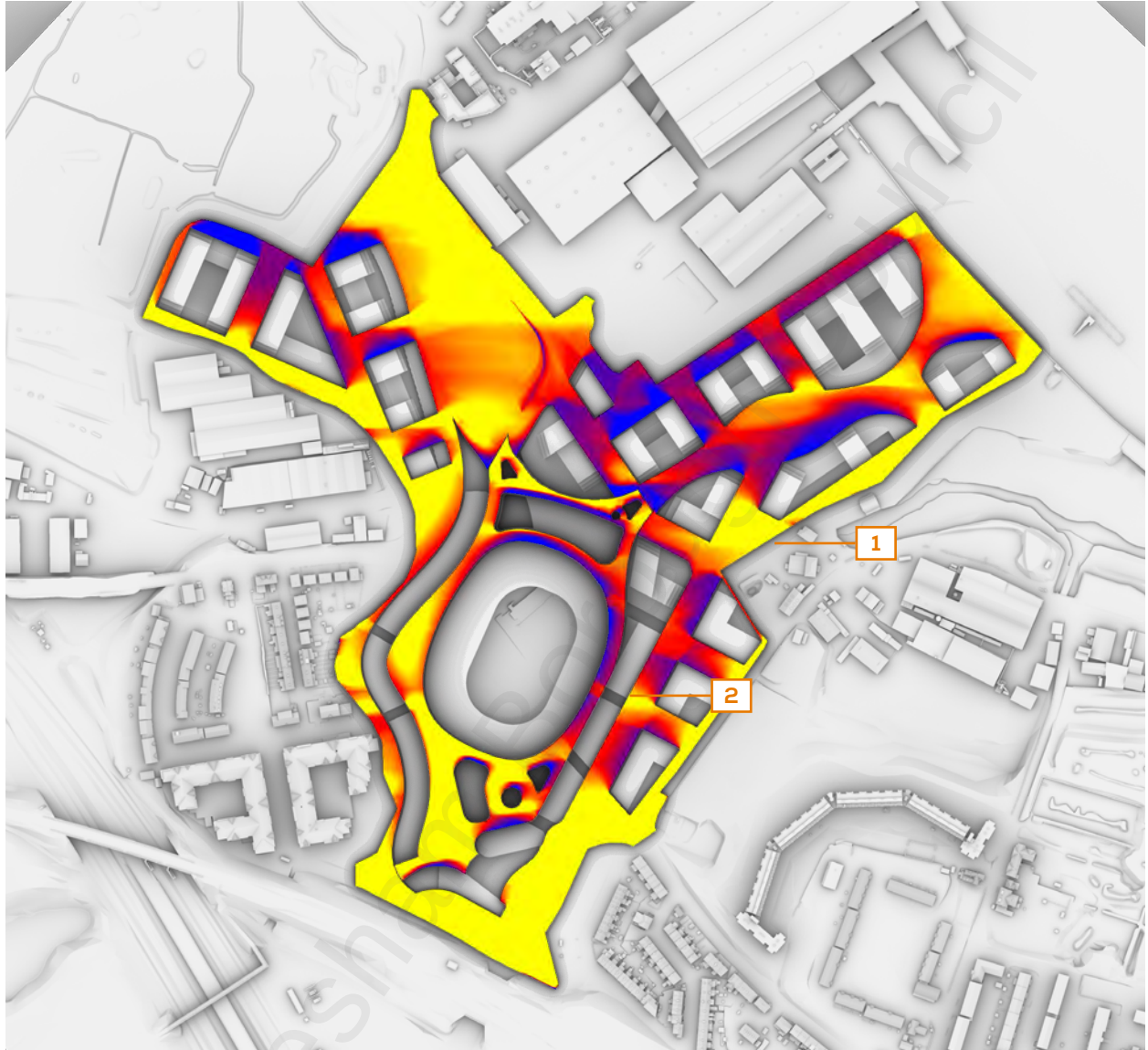
AREA	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
% 2+ h	96	95	57	100	83	31	22	86	90	1	85	0	100	45	100	61

AREA	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
% 2+ h	99	27	100	100	100	96	100	7	28	48	66	68	100	100	100

SUN HOURS ON GROUND
BRE TEST - 21ST MARCH



OVERSHADOWING ASSESSMENT - PUBLIC REALM
SUN EXPOSURE ON GROUND - 21ST MARCH



SUN EXPOSURE
TOTAL HOURS



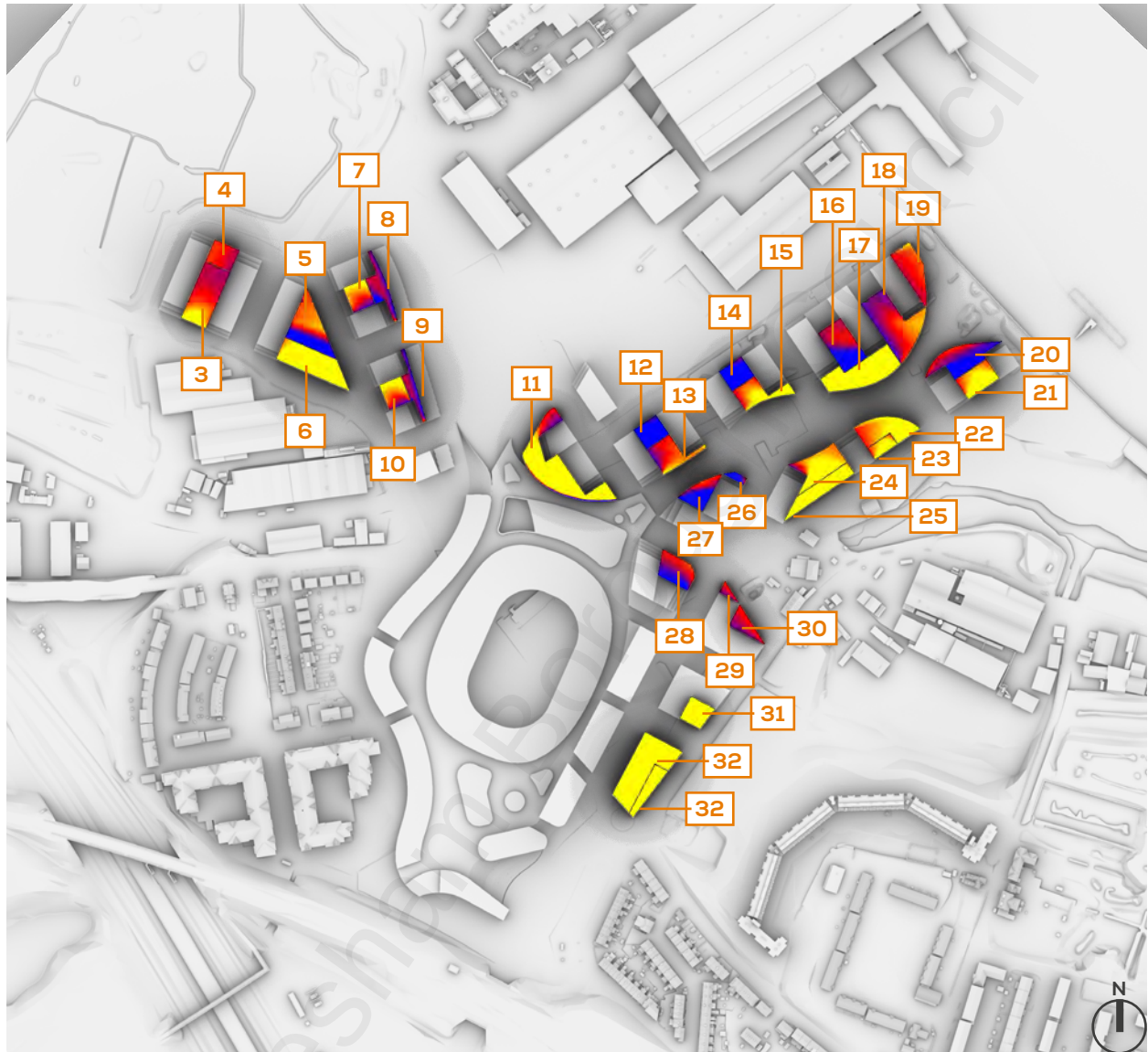
21st MARCH
(SPRING EQUINOX)

HARLOW

Latitude: 51.8
Longitude: 0.1
Sunrise: 05:59 GMT
Sunset: 18:14 GMT

Total Available Sunlight:
12hrs 15mins

OVERSHADOWING ASSESSMENT - COMMUNAL AREAS
SUN EXPOSURE ON GROUND - 21ST MARCH



SUN EXPOSURE
TOTAL HOURS



21st MARCH
(SPRING EQUINOX)

HARLOW

Latitude: 51.8
Longitude: 0.1
Sunrise: 05:59 GMT
Sunset: 18:14 GMT

Total Available Sunlight:
12hrs 15mins

OVERSHADOWING ASSESSMENT - PUBLIC REALM
SUN EXPOSURE ON GROUND - 21ST JUNE



SUN EXPOSURE
TOTAL HOURS



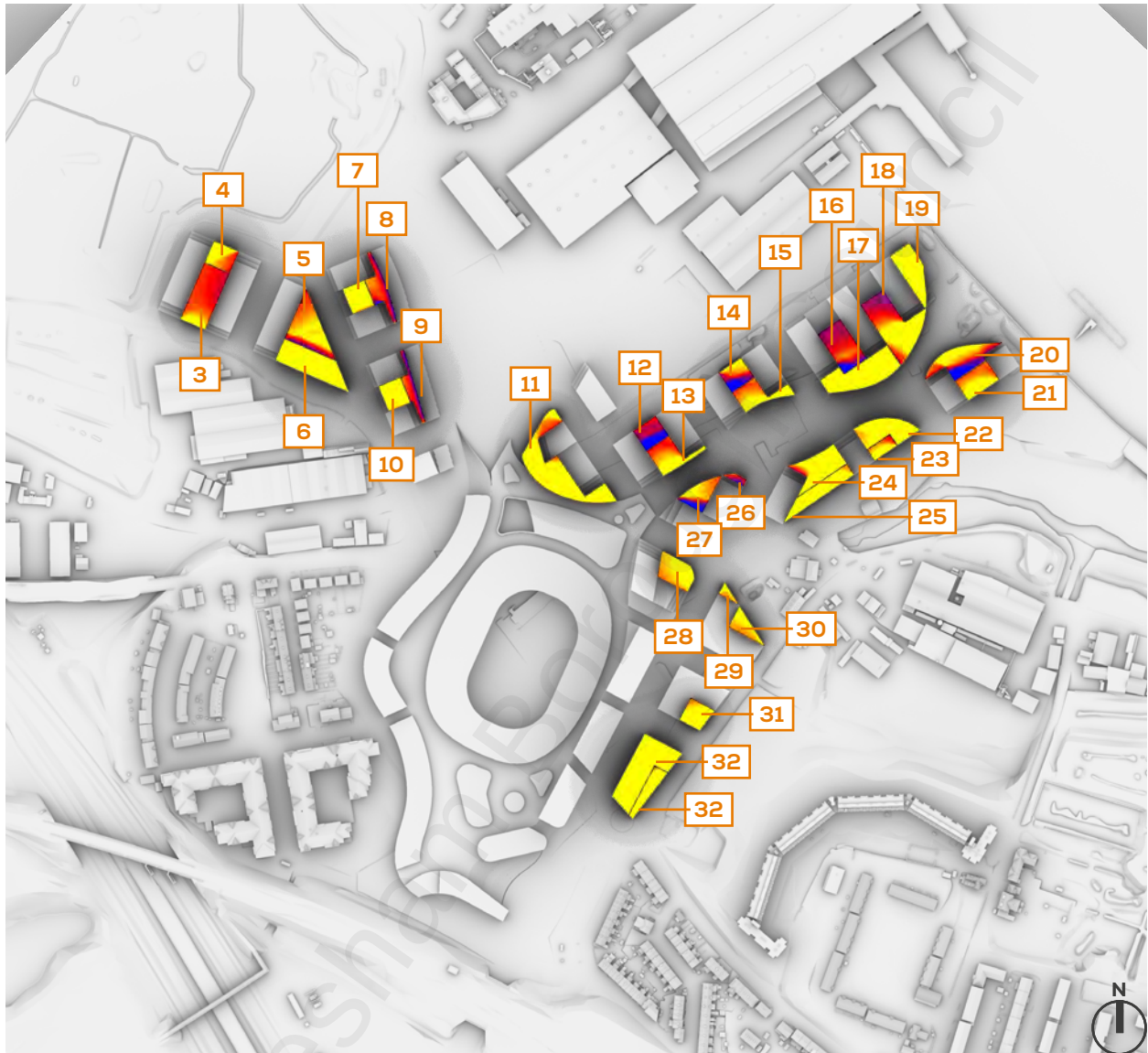
21st JUNE
(SUMMER SOLSTICE)

HARLOW

Latitude: 51.8
Longitude: 0.1
Sunrise: 04:40 GMT
Sunset: 21:22 GMT

Total Available Sunlight:
16hrs 41mins

OVERSHADOWING ASSESSMENT - COMMUNAL AREAS
SUN EXPOSURE ON GROUND - 21ST JUNE



SUN EXPOSURE
TOTAL HOURS



21st JUNE
(SUMMER SOLSTICE)

HARLOW

Latitude: 51.8
Longitude: 0.1
Sunrise: 04:40 GMT
Sunset: 21:22 GMT

Total Available Sunlight:
16hrs 41mins



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