

Client: London Square

Overshadowing Assessment for the Proposals at Extension to Ascot High Street

June 2023

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Overshadowing Assessment for the Development at Extension to Ascot High Street

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1 Executive Summary

The detailed analysis undertaken as part of this assessment has examined the availability of sunlight and overshadowing that will be enjoyed by five key amenity areas located around Blocks 1, 2, 6 and 7 of the proposed development.

A small number of concerns relating to sunlight and overshadowing were raised by consultees as part of the planning application. Firstly, a concern was raised that the 'impact of overshadowing will be considerable'. The quantitative and qualitative analysis undertaken in this assessment shows between 21st March and 21st September, all of the key amenity areas will be in direct sunlight at some point of the day and will enjoy dappled shade from the retained and proposed trees. It should also be considered that shade provided by buildings and trees also has positive benefits on the surrounding area.

Secondly, Sunninghill and Ascot Parish Council expressed concerns that the application fails to comply with BLP principles 'SP2 (mitigation of climate change and use of trees to provide shady amenity areas)'. The analysis undertaken in this assessment shows clearly that the five key amenity areas will be partly in shadow at some point of the day as a result of the building form, including on the summer solstice. In addition, there are a number of retained and proposed trees in these amenity areas which will provide dappled shade to these areas throughout the year.

Lastly, a concern was raised that the overshadowing images initially provided have been cropped to not show the full extent of the shade created. The initial set of overshadowing images (issued May 2022) were intentionally concentrated

on the five key amenity areas around Blocks 1, 2, 6 and 7. The scale of the images was chosen to provide the clearest image of these amenity areas. However, in response to concerns, the updated overshadowing images have been scaled to show a wider area of the site.

From this analysis it has been shown that across the development, all of the key amenity areas will be in direct sunlight at some point of the day, with good sunlight availability during the summer months between the spring and autumn equinox. These amenity areas will also enjoy dappled shade from the retained and proposed trees.



2 Background and Scope of Appraisal

2.1 Study Objectives

Herrington Consulting has been commissioned by London Square to assess the potential impact of the proposed development at Extension to Ascot High Street , in relation to overshadowing on the proposed public amenity areas around Blocks 1 and 2 and between Blocks 6 and 7.

The key objectives of the assessment are to:

- analyse the potential impacts of the development on the overshadowing and sun on the ground conditions that will be experienced by the shared public amenity spaces where applicable, and;
- assess these impacts in line with any relevant planning policies and best practice guidance.

2.2 Site Location

The application site comprises the western part of the Strategic Allocation AL16 of the adopted Borough of Windsor and Maidenhead Local Plan in the town of Ascot. The development site is located immediately south of High Street and immediately east of Station Hill Road. The location of the site is shown in Figure 1.1 and the site plan included in Appendix A.1 of this report gives a more detailed reference to the site location and layout.

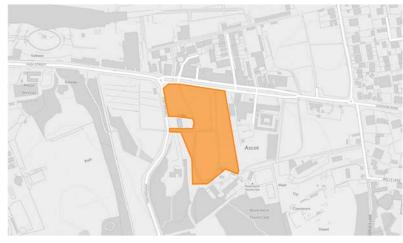


Figure 1.1 – Location map (Contains Ordnance Survey data © Crown copyright and database right 2011)

2.3 The Development

The proposal for development is for the Redevelopment of existing site to provide 1,798.9sqm flexible commercial floorspace and 278.5sqm flexible community floorspace (mix of uses within Use Classes E, F1 and F2) and 117 dwellings with associated parking, access, open space, landscaping and other associated works. Provision of new public open space with associated hard and soft landscape works, new pedestrian and cycle paths and children's play area.

Drawings of the proposed scheme are included in Appendix A.1 of this report.



3 Policy and Guidance

3.1 National Planning Policy

National Planning Policy Framework (Revised July 2021)

Paragraph 125 on 'Achieving appropriate densities' states that "c) local planning authorities should refuse applications which they consider fail to make efficient use of land, taking into account the policies in this Framework. In this context, when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site (as long as the resulting scheme would provide acceptable living standards)."

3.2 Local Planning Policy

Royal Borough of Windsor and Maidenhead – Borough Local Plan 2013-2033 (February 2022)

Policy QP3 Character and Design of New Development states that '1) New development will be expected to contribute towards achieving sustainable high quality design in the Borough. A development proposal will be considered high quality design and acceptable where it achieves the following design principles: I. Provides sufficient levels of high quality private and public amenity space; m. Has no unacceptable effect on the amenities enjoyed by the occupants of adjoining properties in terms of privacy, light, disturbance, vibration, pollution, dust, smell and access to sunlight and daylight'.

Borough Wide Design Guide (June 2020)

Paragraph 8.16-8.18 on Sunlight Access to states that 'provided it can be controlled, people love sunlight and likewise, its absence has a damaging effect. Neighbours will often be particularly distressed if new development threatens their existing private sunny spaces. Accordingly, when drawing up their plans developers should consider the following sunlight needs:

- sun access for habitable indoor spaces of both new and existing neighbouring development. The needs for people who spend a large proportion of their day indoors, (including older people), will require particular consideration.
- Sun access to habitable residential outdoor spaces of both new and existing neighbouring development;
- Provision or maintenance of good sunlight to public realm social spaces and focal points such as squares, pause points, gardens and pocket parks.

Potential design solutions to provide good quality solar access include:

- Providing for direct sunlight to enter at least one habitable room for part of the day through-out the year. Dual aspect dwellings will assist with this;
- Providing private external spaces (patios, gardens, balconies, roof terraces) that receive direct sunlight for part of the day in the period between 1st April and 30th September;
- Providing public realm social focal point spaces with direct sunlight for a good part of the day in the period between 1st April and 30th September.



The main guidance principles relating to daylight and sunlight availability are included in Principle 8.3 and are as follows:

- 1. The occupants of new dwellings should be provided with good quality daylight and sun access levels to habitable internal rooms and external spaces.
- 2. Dual aspect dwellings are strongly encouraged. Where single aspect dwellings are proposed, developers should demonstrate how good levels of ventilation, daylight and sun access will be provided to habitable spaces. Single aspect residential units that are north facing should be avoided.
- 3. New public realm social focal point spaces should be provided with direct sunlight for a good part of the day in the period between 1st April and 30th September.
- 4. Developments should not result in occupants of neighbouring dwellings or nearby public realm social spaces suffering from a material loss of daylight and sun access.

3.3 Best Practice Guidance

In the absence of official national planning guidance / legislation on daylight and sunlight, the most recognised guidance document is published by the Building Research Establishment and entitled 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice', Second Edition, 2011; herein referred to as the 'BRE Guidelines'.

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

In conjunction with the BRE Guidelines further guidance is given within the British Standard (BS) 8206-2:2008: 'Lighting for buildings - Part 2: Code of practice for daylighting'.

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

Whilst the BRE Guidelines provide numerical guidance for daylight, sunlight and overshadowing, these criteria should not be seen as absolute targets. The document states that the intention of the guide is to aid rather than constrain the designer. The Guide is not an instrument of planning policy, therefore whilst the methods given are technically robust, it is acknowledged that some level of flexibility should be applied where appropriate.



4 Assessment Techniques

4.1 Background

Natural light refers to both daylight and sunlight. However, a distinction between these two concepts is required for the purpose of this overshadowing assessment. The term 'Daylight' is used for natural light where the source is the sky in overcast conditions, whilst 'Sunlight' refers specifically to the light coming directly from the sun. Therefore, for the study of overshadowing, only sunlight is considered.

4.2 Overshadowing

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

Sun Hours on Ground

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

When undertaking this analysis, sunlight from an altitude of 10° or less has been ignored as this is likely to be obscured by planting and undulations in the

surrounding topography. Driveways and hard standing for cars is also usually left out of the area used for this calculation. Fences or walls less than 1.5 metres high are also ignored.

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

Transient Overshadowing

The BRE Guidelines suggest that where large buildings are proposed, which may affect a number of open spaces or amenity areas, it is useful and illustrative to plot a shadow plan to show the location of shadows at different times of the day and at key times during the year. Typically, the 21st March, the 21st June, and 21st December are used to represent the annual variance of sun position, noting that the position of the sun in the sky during the spring equinox (21st March) is equivalent to that of the autumn equinox.

The BRE Guidelines provide no criteria for the significance of transitory overshadowing other than to suggest that by establishing the different times of day and year when shadow would be cast over surrounding areas, provides an indication as to the significance of the likely effect of a new development. The assessment of transient overshadowing effects is therefore based upon expert judgment, taking into consideration the likely effects of the various baseline conditions and comparing them with the likely significant transient overshadowing effects of the redevelopment proposals.



5 Assessment Methodology

5.1 Method of Baseline Data Collation

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

- OS Mastermap mapping
- Scheme drawings in AutoCAD format (DHA Architecture June 2023)
- 3D Building model including trees constructed using photogrammetric techniques based on 2019 satellite imagery (Accucities – April 2022)
- Aerial photography (Google Maps and Bing)

5.2 Identification of Key Sensitive Receptors

Specific concerns have been raised about the sunlight availability to five key amenity areas in close proximity to the proposed developments Blocks 1, 2, 6 and 7. The areas that have been included for overshadowing analysis are:

- 1a. Land west of Block 1
- 1b. Land between Blocks 1 and 2
- 1c. Land southeast of Block 1
- 1d. Land east of Block 2
- 2a. Land between Blocks 6 and 7

The location of these areas are identified in Images 5.1 and 5.2 below and the overshadowing images for these areas are included in Appendix A.2.



Image 5.1 – Location of Area 1 in orange with key sites identified in grey





Image 5.2 – Location of Area 2 in orange with key site identified in grey

5.3 Numerical Modelling

The numerical analysis used in this assessment has been undertaken using the Waldrum Tools (Version 6.0.0.11) software package.

5.4 Calculation Assumptions

The following assumptions have been made when undertaking the overshadowing analysis:

 In areas where survey data has not been provided or needs to be supplemented with additional information, photographs, OS mapping, 3D photogrammetry data and brick counts have been used in the process of building the 3D model of the surrounding and existing buildings.

• When analysing the effect of the new building on the amenity areas, the shading effect of the existing and proposed trees has been ignored. This is the recommended practice where deciduous trees that do not form a dense belt or tree line are present (BRE Guidelines – Appendix H). This is because daylight is at its scarcest and most valuable in the winter when most trees will not be in leaf. The location of the retained and proposed trees are indicated in plan form but the nature of shading from the trees has not been taken into account. This is because the trees will provide a desirable dappled shade to the public amenity areas. The allowance for dappled shade is also beneficial in addressing matters relating to solar gain and climate change as they provide desirable shadowing to buildings and public spaces.

5.5 Assessment criteria

The BRE Guidelines acknowledge that good site layout planning for daylight and sunlight should not limit itself to providing good natural light inside buildings. Sunlight in the space between buildings has an important effect on the overall appearance and ambiance of a development. The worst situation is to have significant areas on which the sun does not shine for a large part of the year. These areas would, in general, be damp, chilly and uninviting.

The BRE Guidelines set out the following principal benefits of sunlight in the spaces between buildings:



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

The assessment criteria set out within the BRE Guidelines is based on the recommendation that for an amenity space to appear adequately sunlit throughout the year, at least half of this area should receive at least two hours of sunlight on 21st March.



6 Sun on the Ground Overshadowing Analysis

6.1 Sun on the Ground Analysis Background

In applying this test, the BRE Guidelines suggest that the Spring Equinox (21st March) is the most suitable date for the assessment and therefore using specialist software, the path of the sun is tracked to determine where the sun would reach the ground and where it would not.

The BRE guidelines recommend that at least half of a garden or amenity area should receive at least 2 hours of sunlight on March 21st.

Typical examples of areas that could be considered as open spaces or amenity areas are main back gardens of houses, allotments, parks and playing fields, children's playgrounds, outdoor swimming pools, sitting-out areas, such as in public squares and focal points for views. However, in this case, five key areas of importance have been identified by the client which are location in and around Blocks 1, 2, 6 and 7 of the proposed development site.

For these five areas, the 2 hour sun on the ground test has been applied and the results of this analysis are summarised in Table 6.1. The graphical results of the overshadowing analysis are included in the appendix to this report.

From the results summarised in Table 5.1, it can be seen that the five key amenity areas that have a specific need for good sunlight availability will all exceed the BRE recommended guidelines of achieving 2 hours of direct sunlight to 50% of the area on 21st March. It should also be noted that between 21st March and 21st September, the sunlight availability will increase from these reported values.

Amenity Reference	Amenity Location	% of area lit for 2 hours or more on the 21 st March	Compliant with BRE criteria?	
1a.	Land west of Block 1	100%	Yes	
1b.	Land between Blocks 1 & 2	69%	Yes	
1c.	Land southeast of Block 1	85%	Yes	
1d.	Land east of Block 2	100%	Yes	
2a.	Land between Blocks 6 & 7	99%	Yes	

Table 6.1 – Results of the Sun on Ground analysis on 21st March

6.2 Transient Overshadowing Background

With traditional rear gardens and public open spaces that are potentially used all year round, it is acknowledged by the BRE Guidelines that the 21st March equinox is primarily used, as this represents more of a worst case scenario than an assessment during the summer when shadows are shorter and impacts of new development are less magnified. The 2-hour sun on the ground test is therefore a useful and quantitative method of assessing the impact of overshadowing.

However, in some situations, and especially where taller buildings are proposed, it is also useful to understand the extent of overshadowing that may occur at different times of the day and how this varies throughout the year. This is specifically useful where, for example an amenity space may be used at a very specific time of day or year. Whilst the transient overshadowing study does not



provide any quantitative output, the graphical outputs are beneficial in that they allow the shadowing impacts to be more readily understood.

Overshadowing of the amenity areas has therefore been assessed at hourly intervals from 8am to 6pm on the 21st March, 7am to 8pm on the 21st June and 9am to 3pm on the 21st December. The overshadowing images for Sites 1a.-1d. are included in Appendix A.2 and the images for Site 2a is included in Appendix A.3 of this report.

6.3 Discussion of Overshadowing Results

The images produced as part of the Transient Overshadowing analysis are included in Appendix A.4 for the three periods during the year when the simulations were undertaken. It should be noted that in accordance with BRE recommended guidance, the proposed and retained trees have not been included in these simulations as their precise shapes are almost impossible to predict and accurately model, and also because the dappled shade of a tree is more pleasant than a deep shadow of a building. However, the location of the trees can be seen in these images so it is possible to envisage where dappled shade will be available to future users of these spaces.

The results of the transient overshadowing analysis are discussed as follows:

Area 1 (Sites 1a, 1b, 1c & 1d)



Spring equinox - 21st March (also representative autumn equinox)

Site 1a – This area will mostly be in shadow until after 10am. It will then remain in full sunlight until the end of the day at around 5pm. Parts of this area will also be in dappled shade from the proposed trees along the Station Hill frontage of Block 1.

Site 1b – This area will mostly be in shadow of Block 2 until the early afternoon when direct sunlight will come from the south west. By mid-afternoon between



3pm and 4pm, this area will be in full sunlight although it will benefit from dappled shade from the proposed trees between Blocks 1 and 2.

Site 1c – This area will enjoy some direct sunlight in the early hours between 8am-9am. Parts of this amenity area will be in sunlight again from midday until 3pm and parts of this area will also be in shadow during this time. The plan for this area is to provide outdoor seating and therefore, future users will be able to choose whether to sit in sunlight or shade depending on the time of day.

Site 1d – This area is in full sunlight from 8am to around midday on 21st March so future users will enjoy the sunlight during the morning. However, this area will enjoy some dappled shade from the retained trees to the east. From midday onwards, this area is mostly in shadow of Block 2.

Summer Solstice - 21st June

Site 1a – This area will mostly be in shadow until after 10am. It will then remain in direct sunlight until the end of the day at around 6-7pm. Parts of this area will also be in dappled shade from the proposed trees along the Station Hill frontage of Block 1.

Site 1b – Part of this amenity area will be in full sunlight throughout the day with the northern half of the area in sunlight from 7am to 5pm. The southern part of the area closest to Block 2 will be in shade throughout the morning until the early afternoon at around 2pm when the whole area is in full sunshine for a couple of hours. This area will also benefit from dappled shade from the proposed trees between Blocks 1 and 2, providing some dappled shade during the most sunlit hours.

Site 1c – This area will enjoy direct sunlight in the morning between 7am and midday when gradual shadow will be cast from Block 1 across the area until 3pm when the area will be in full shadow for the remainder of the day.

Site 1d – This area is in full sunlight from 7 am to around 1pm on 21st March so future users will primarily enjoy the sunlight during the morning. From midday onwards, this area is mostly in the shadow of Block 2.

Winter Solstice - 21st December

Site 1a – This area will mostly be in shadow until after 11am. It will then remain in full sunlight until sunset just after 3pm. Parts of this area will also be in dappled shade from the proposed trees along the Station Hill frontage of Block 1.

Site 1b – The western part of this amenity area will receive direct sunlight from between 10-11am until sunset at around 3pm. The eastern part of this amenity area will be in shadow of Block 2 for much of the day.

Site 1c – This small seating area will be in shadow for most of the day on 21st December.

Site 1d – This amenity area will have direct sunlight from sunrise at around 9 am to around midday on 21st December. From around midday onwards, this area is mostly in shadow of Block 2.



Area 2 (Site 2a)



Spring equinox - 21st March (also representative autumn equinox)

Site 2a – This area will have direct sunlight throughout the whole day from 9am to 5pm although the trees in this area will provide dappled shade in localised areas.

Summer Solstice - 21st June

Site 2a - Again, this area will be in direct sunlight throughout the whole day from 7am until 7pm and will benefit from dappled shade in localised areas from the retained and proposed trees.

Winter Solstice - 21st December

Site 2a - At this time of year, when the sun is at its lowest in the sky, this area will be in shadow until around 11am when the northern part of the amenity area will be in sunlight. The area in sunlight will increase gradually southwards until after 2-3pm when the sun becomes too low in the sky.

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7 Conclusions

The detailed analysis undertaken as part of this assessment has examined the availability of sunlight and overshadowing that will be enjoyed by five key amenity areas located around Blocks 1, 2, 7 and 8 of the proposed development. This has been carried out using two very different methodologies, but both in line with the assessment criteria prescribed by the BRE Guideline.

The first of these has examined the quantitative availability of sunlight to amenity areas using the 2-hour sun on the ground test. This has been undertaken on the on the 21st March, which is a time of year where overshadowing impacts are more exaggerated. This test has shown that all of these areas will meet the recommended target values for sunlight availability.

The second assessment technique used has been the transient overshadowing analysis, which provides a more graphical summary of the change in overshadowing resulting from the proposed development. This is shown for hourly periods throughout the day and at a range of seasons throughout the year. This allows a more qualitative assessment of the sunlight availability to be undertaken and is also useful in identifying specific areas that may be sensitive to overshadowing.

From this analysis it has been shown that between 21st March and 21st September, all of the key amenity areas will be in direct sunlight at some point of the day and will enjoy dappled shade from the retained and proposed trees.

In summary, the development proposals have been appraised in line with the guidelines set out in the BRE document. When assessed against the criteria for establishing whether the proposed development will provide acceptably sunlit amenity spaces, it has been possible to conclude that a good level of sunlight will be available to the users of these amenity areas throughout the year and the four largest amenity areas will still enjoy direct sunlight at some point of the day on 21st December.



A Appendices

Appendix A.1 – Scheme Drawings

Appendix A.2 – Graphical Model Outputs – Area 1

Appendix A.3 – Graphical Model Outputs – Area 2

Appendix A.4 – Results for Two Hour Sun on Ground Calculations



Appendix A.1 – Scheme Drawings

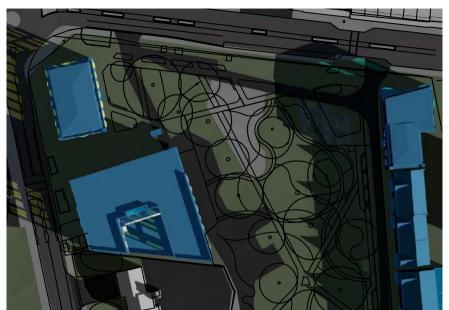


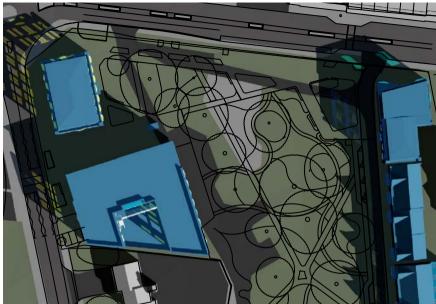


Appendix A.2 – Graphical Model Outputs – Area 1 (Sites 1a, 1b, 1c and 1d)

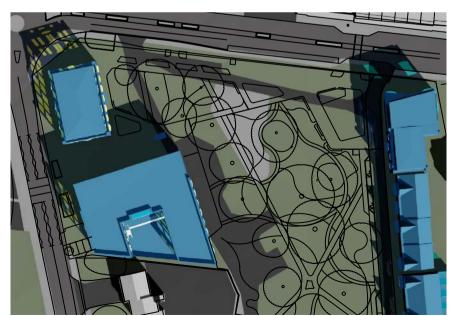


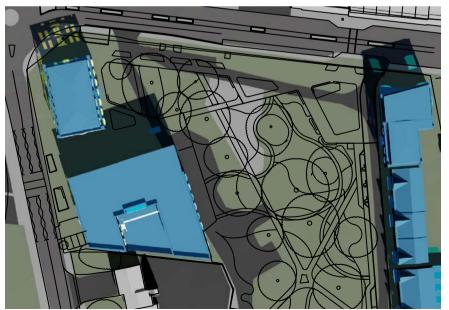






8am Shadow Positions 9am Shadow Positions

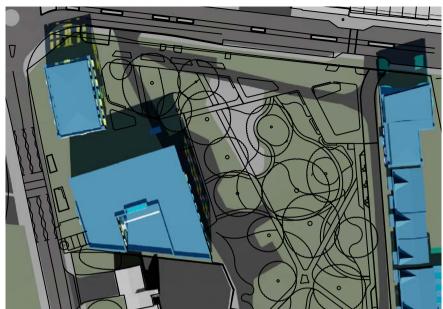


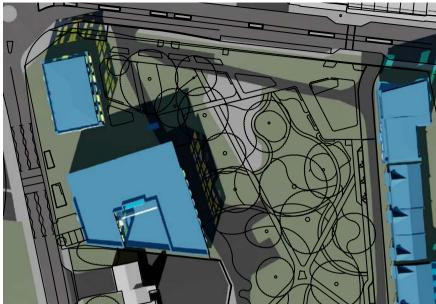


10am Shadow Positions 11am Shadow Positions

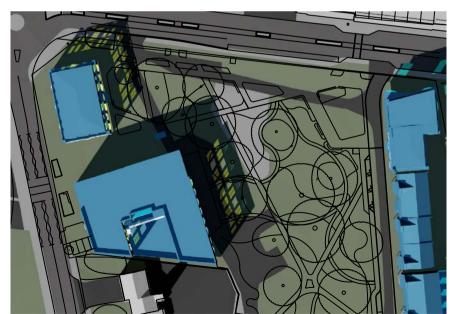


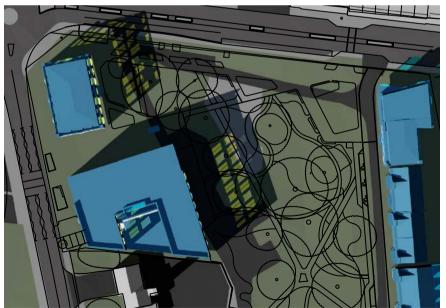






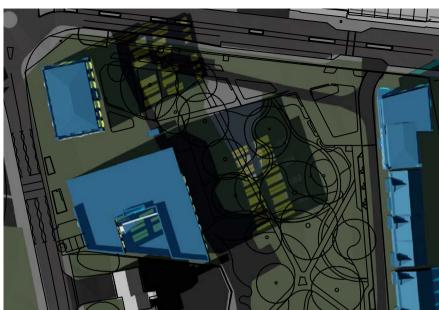
12pm Shadow Positions 1pm Shadow Positions

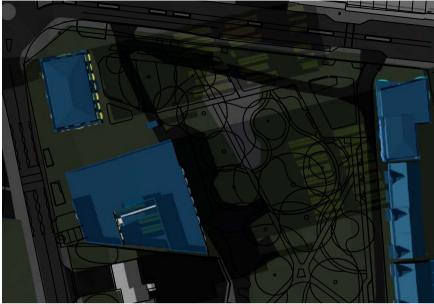




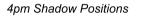
2pm Shadow Positions 3pm Shadow Positions

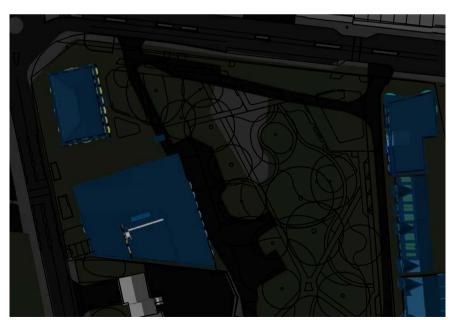








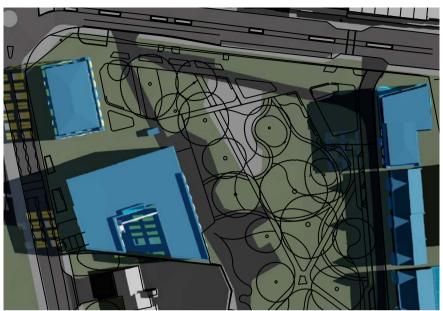


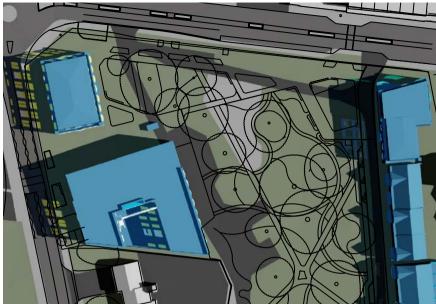


6pm Shadow Positions

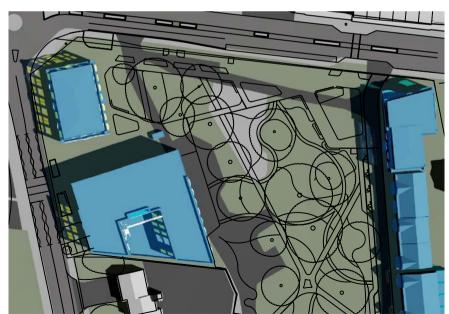


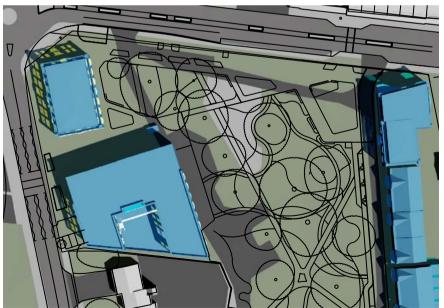






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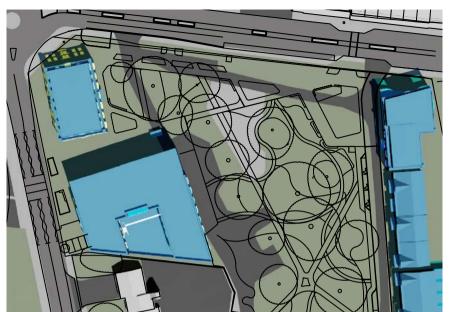


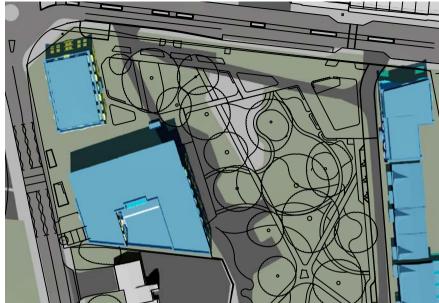


9am Shadow Positions 10am Shadow Positions



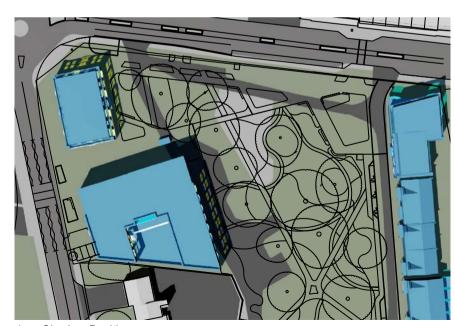


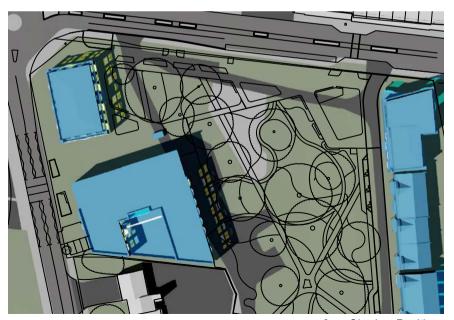




11am Shadow Positions

12pm Shadow Positions



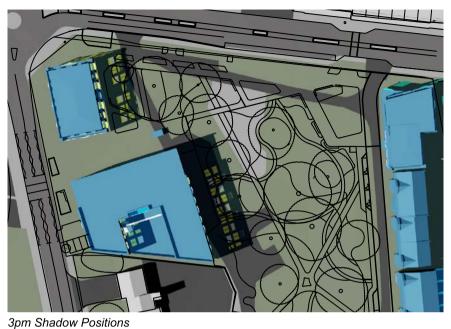


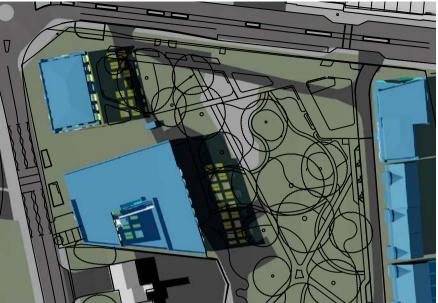
1pm Shadow Positions

2pm Shadow Positions

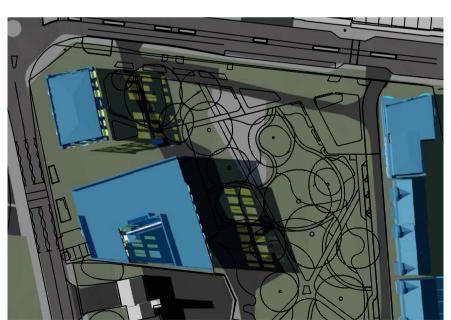


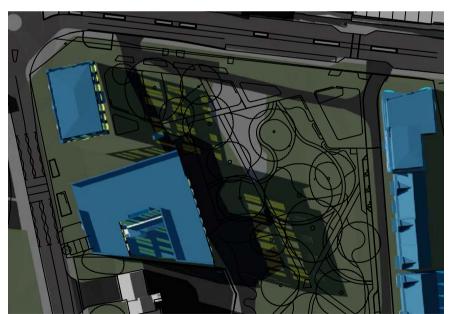






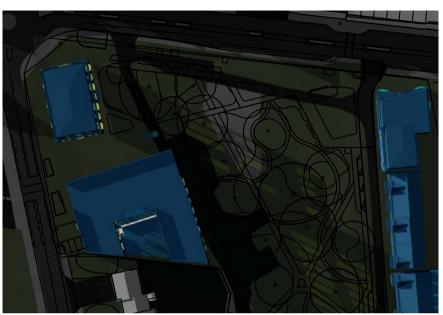
4pm Shadow Positions

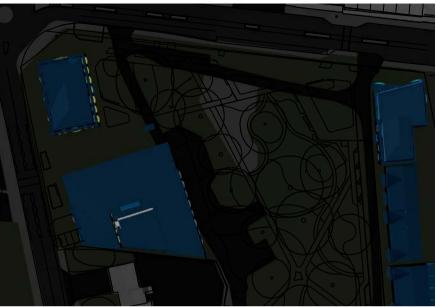


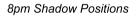


5pm Shadow Positions 6pm Shadow Positions





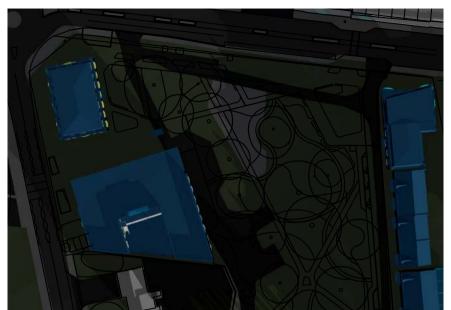


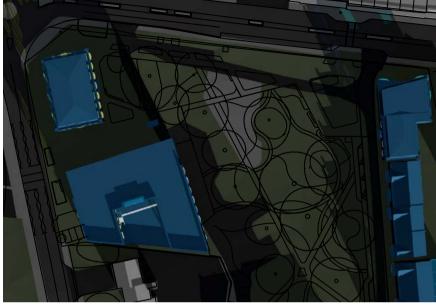


7pm Shadow Positions

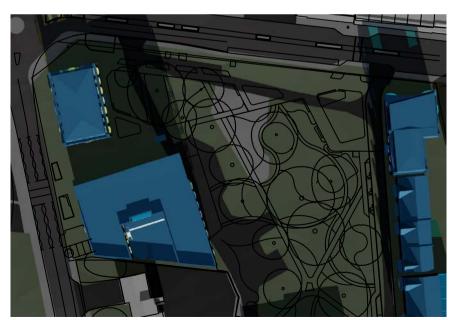


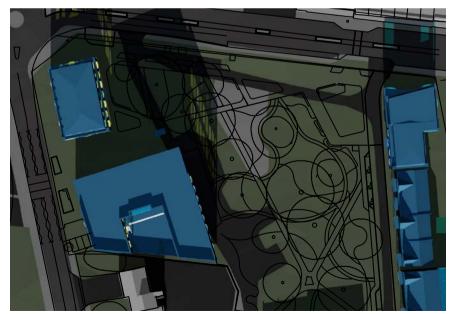






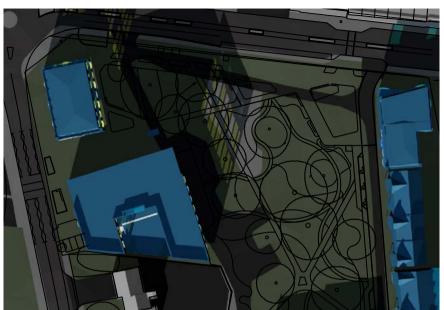
9am Shadow Positions 10am Shadow Positions

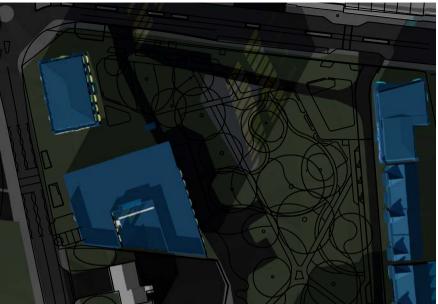




11am Shadow Positions 12pm Shadow Positions



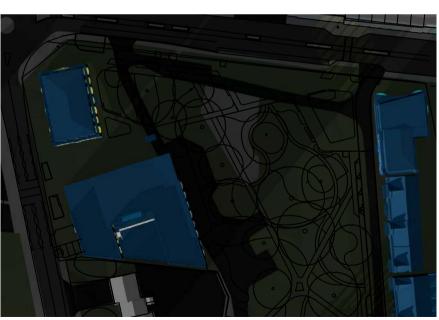






2pm Shadow Positions

1pm Shadow Positions



3pm Shadow Positions