HODKINSON

**Daylight & Sunlight Report**

Quantum Group

# Former ICL Private Ground

Final

**Elena Pana**
Dip Arch, MSc, ARB
Date: 14th August 2017

# DOCUMENT CONTROL RECORD
REPORT STATUS: FINAL

| Version | Date | Reason for issue | Author | Checked by | Approved for Issue by Project Manager |
|---|---|---|---|---|---|
| v.1 | 23.06.2017 | Draft | EP | OT | CS |
| v.2 | 13.07.2017 | Final | EP | OT | CS |
| v.3 | 14.08.2017 | Final | EP | CS | CS |

# ABOUT HODKINSON CONSULTANCY

Our team of technical specialists offer advanced levels of expertise and experience to our clients. We have a wide experience of the construction and development industry and tailor teams to suit each individual project.

We are able to advise at all stages of projects from planning applications to handover.

Our emphasis is to provide innovative and cost effective solutions that respond to increasing demands for quality and construction efficiency.

---

# Executive Summary

Hodkinson Consultancy has been instructed by Quantum Group to assess the impact of the proposed development at Former ICL Private Ground in the London Borough of Richmond Upon Thames upon daylight and sunlight amenity for existing dwellings surrounding the site, and to demonstrate the predicted internal daylight levels of the proposed dwellings.

This report fully considers the methodology of the publication of the second edition of the BRE Guidelines 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice' (2011) and has also been prepared in line with British Standards 8206. The BRE guidance stated that it is intended for designers and their clients, consultants and planning officials. The guidance is not mandatory and states that it should not be seen as an instrument of planning policy.

Therefore, failure to achieve the stated target numerical factors does not necessarily mean that the development is unsuitable or that planning permission should be refused.

The report includes the following assessments and findings in relation to the proposed development:

## Average Daylight Factor Assessment: Proposed Dwellings

> An internal daylight assessment using the Average Daylight Factor metric (ADF), has been undertaken for thirteen (13) representative dwellings of the proposed development, which accounts for 12% of the total 108 number of dwellings . Simulated results show that 78% of the assessed habitable rooms present acceptable levels of internal daylighting.

## Daylight & Sunlight Assessment: Existing Dwellings

> The proposed development does not subtend the 25° obstruction angle for any of the neighbouring windows apart from one dwelling, indicating that the diffuse daylighting of the existing buildings will not be significantly affected by the proposed development.

> The BRE VSC criteria were assessed for the north façade of the dwelling for which the proposed development subtends the 25° obstruction angle. Based on the BRE Guidance three assumed windows fail to meet the suggested VSC criteria, however, the criteria are met when the model takes into account the local fence located in front of the assessed windows.

## Overshadowing Assessment: Gardens and Amenity Space

> The shadow plot diagrams indicate that for the majority of the year the garden and amenity space of the proposed development remains unaffected.

> The overshadowing effect becomes more intense at the north east and north west of the proposed development during the winter months when the sun angle is low.

# CONTENTS

# 1. INTRODUCTION

**1.1** This document has been prepared to review the impact of the proposed development at Former ICL Private Ground upon daylight and sunlight amenity for existing dwellings surrounding the site, and to demonstrate the predicted internal daylight levels of the proposed dwellings.

**1.2** The report uses the following techniques where required, in accordance with guidance published by BRE:

> 25° obstruction plane;

> Vertical Sky Component;

> Overshadowing assessment of the gardens and amenity space;

> Average Daylight Factor (ADF) for the proposed development.

## Site Location

**1.3** The proposed development is located in Teddington, between Udney Park Road to the west and Kingston Lane to the east. It is a short walk from Teddington High Street (A313).

**1.4** The site is currently private open ground and is not accessible to the wider community. The existing sports pavilion is located to the west of the site, and is proposed for refurbishment.

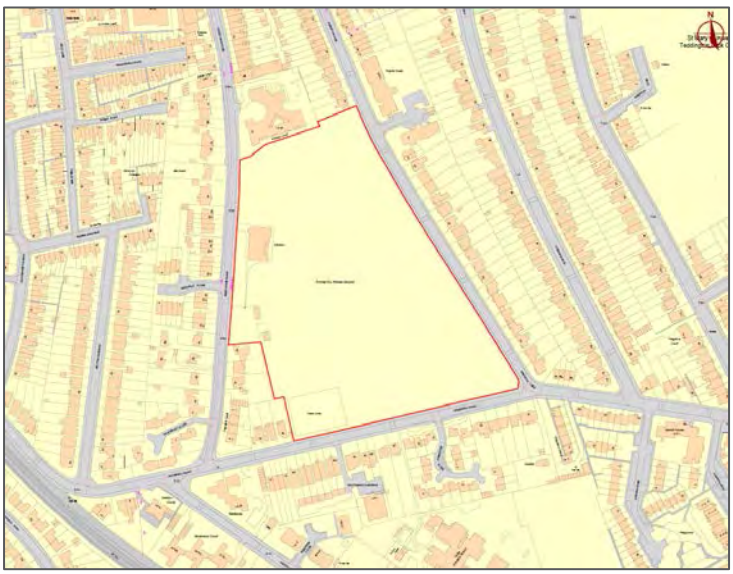


**Figure 1: The Development Site (Quantum Group Location Plan – Ref. 900-SK01)**

## Proposed Development

**1.5** The proposed scheme will see the former Imperial College London Private Ground on Udney Park Road, Teddington, London, TW11 9BB, regenerated for a mixed-use development that will deliver high-quality sports and community facilities, alongside new public open space and affordable, care led accommodation for Older People. This triple approach secures a sustainable, inclusive future for the site, the benefits of which underpin national and local planning policy.

**1.6** With the creation of the Teddington Community Sports Ground Community Interest Company, three areas will be established :

- Assisted living, extra care community and new GP surgery;
- Open parkland with community Orchard and outdoor gym;
- Community sports facilities.

**1.7** The proposed community sports facilities will comprise of the following:

- A full-size Third Generation artificial grass pitch (3G AGP)
- Natural grass playing pitch provision;
- Tennis Courts / MUGA;
- Community pavilion containing changing rooms, kitchen, bar and server, flexible-use community rooms and crèche.

**1.8** The proposed development site plan is set out in Figure 2. The main Extra Care assisted living units are located to the north-west of the site, and the main sports area is located to the south.

**Figure 2: The Proposed Development Site Plan (Quantum Group Proposed Site Plan– Ref. 900-SK02)**

# 2. POLICY & GUIDANCE

# Local Policy: London Borough of Richmond Upon Thames

**2.1** Policies pertinent to this application include:

## Richmond Development Management Plan

**2.2** **Policy DM DC 5 – Neighbourliness, Sunlighting and Daylighting** –the Council will seek to protect adjoining properties from unreasonable loss of privacy, pollution, visual intrusion, noise and disturbance. The Council will generally seek to ensure that the design and layout of buildings enables sufficient sunlight and daylight to penetrate into and between buildings, and that adjoining land or properties are protected from overshadowing in accordance with established standards.

## Local Plan Publication Version for Consultation – (2017)

2.3 **Draft Policy LP8 - Amenity and Living Conditions** - the Council will ensure the design and layout of buildings enables good standards of daylight and sunlight to be achieved in new development and in existing properties affected by new development; where existing daylight and sunlight conditions are already substandard, they should be improved where possible.

# Building Research Establishment (BRE) & British Standard 8206-2:2008

2.4 The **Building Research Establishment** (BRE) has 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 daylighting amenity around and within dwellings.

2.5 This document states that it is also intended to be used in conjunction with the interior daylight recommendations found within the **British Standard BS8206-2:2008**.

2.6 Table 2 of the BS8206-2:2008 Lighting for Buildings – Code for practice for daylighting includes that minimum required Average Daylight Factor values per room type.

2.7 The BS guidance mentions: *Where one room serve more than one purpose, the minimum average daylight factor should be that for the room type with the highest value. For example in a space which combines a living room and a kitchen the minimum ADF should be 2%*.

| Table 1: Average Daylight Factor Tragets | |
|---|---|
| **Room Type** | **Minimum Average Daylight Factor (ADF)** |
| **Bedrooms** | **1.0%** |
| **Living Rooms** | **1.5%** |
| **Kitchens** | **2.0%** |

2.8 The document states: *"The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and this document should not be seen as an instrument of planning policy. Its aim is to help rather than constraint the developer. Although it gives numerical guidelines, these should be interpreted flexibly because natural light is only one of the many factors in site layout design"*. Failure to achieve the stated target numerical factors does not necessarily mean that the development is unsuitable or that planning permission should be refused.

**2.9** The level of 'flexibility' stated within the guidance should be based on particular building design characteristics which are unique for each scheme and should be evaluated for each case being assessed.

**2.10** In addition, design features such as deep recesses, balconies or open internal layout configurations may reduce internal daylighting levels, but on the other hand are utterly beneficial to other aspects of health and well-being of the occupants, e.g. provision of private amenity space, overheating mitigation, modern lifestyle and architectural functionality.

# 3. METHODOLOGY

**3.1** This report has assessed the following in respect of the proposed development and the existing dwellings which surround the development site:

> **Daylight: Proposed Dwellings** – This assesses the level of daylight received by the new dwellings within the proposed development.

> **Daylight: Existing Dwellings** – This assesses the effect of the proposed development on the daylight received by the existing residential dwellings which may be affected.

> **Sunlight: Existing Dwellings** – This assesses the effect of the proposed development on the level of sunlight received by the existing residential dwellings which may be affected.

> **Overshadowing: Gardens and Amenity Space –** This assesses the shading effect of the proposed development on garden and amenity spaces. .

**3.2** Each assessment method and the calculations applied in accordance with the relevant guidance, is detailed below. It should be noted that the assessment does not take into consideration existing or proposed vegetation such as trees or hedges. As mentioned in the BRE guidance, there are no industry benchmarks or modelling assumptions regarding introducing leaf transparencies for summer and winter or regulated tree shapes (either for deciduous or coniferous trees), and therefore it is considered that their impact on daylighting results wouldn't have been realistic.

## Daylight: Proposed Dwellings

**3.3** An assessment of daylight into residential rooms within the proposed development has been carried out. This is to ensure that future residents will benefit from the well-being of adequately lit rooms.

**3.4** The BRE guidance states that daylight provision in new rooms may be checked using the average daylight factor (ADF). The ADF is a quantitative metric of the overall amount of daylight in a space.

**3.5** The BRE guidance sets out detailed tests that assess the interior daylight conditions of rooms; this includes the calculation of the ADF. The ADF is derived from British Standards BS 8206-2:2008. The ADF takes into account the angle of visible sky reaching the window, and takes the following factors into account:

> Window size;

> The number of windows available to the room;

> Room size;

> Use and layout.

**3.6** BS 8206-2:2008 recommends a minimum ADF of **2% for kitchens**, **1.5% for living and dining rooms** and **1% for bedrooms**.

# Daylight: Existing Dwellings

**3.7** The BRE Guidelines provides a decision chart (Figure 3) outlining the sequential tests to be used to determine if a new development significantly affects daylighting levels in neighbouring existing buildings. This hierarchy is summarised below:

> **Distance:** Loss of light to existing windows need not be analysed if the distance of each part of the new development from the existing window is three or more times its height above the centre of the existing window. In this case the loss of light will be small and further analysis is not required.

> **25° Obstruction Angle Rule**: If any part of a new building or extension, measures in a vertical section perpendicular to a main window wall of an existing building, from the centre of the lowest window, subtends an angle of more than 25° to the horizontal, then the diffuse daylighting of the existing building may be adversely affected. If the profile of the building subtends an angle greater than 25° then the VSC test is to be applied in order to investigate the level of harm further.

> **Vertical Sky Component (VSC) Rule**: Any reduction in the total amount of skylight can be calculated by finding the VSC at the centre of each main window. The VSC is a measure of the amount of light striking the face of the window and does not include reflected light, either from the ground or from other buildings. The BRE guidance advises that a pass rate of 27% is required to demonstrate that daylighting levels are acceptable as this would demonstrate that enough skylight should still be reaching the window of the existing building. If less than 27% is achieved, then the 80% test is to be applied;

> **80% rule**: BRE guidance advises that if the VSC is less than 27% but greater than 0.8 times its former value, occupants of the existing building will be unlikely to notice the reduction in the amount of skylight.

> **Daylight Distribution (NSL) rule**: where room layouts are known the 'no sky line' (NSL) can be plotted. If the area of the working plane which can see the sky is greater than 0.8 times its former value, then the daylight conditions will not be significantly affected.

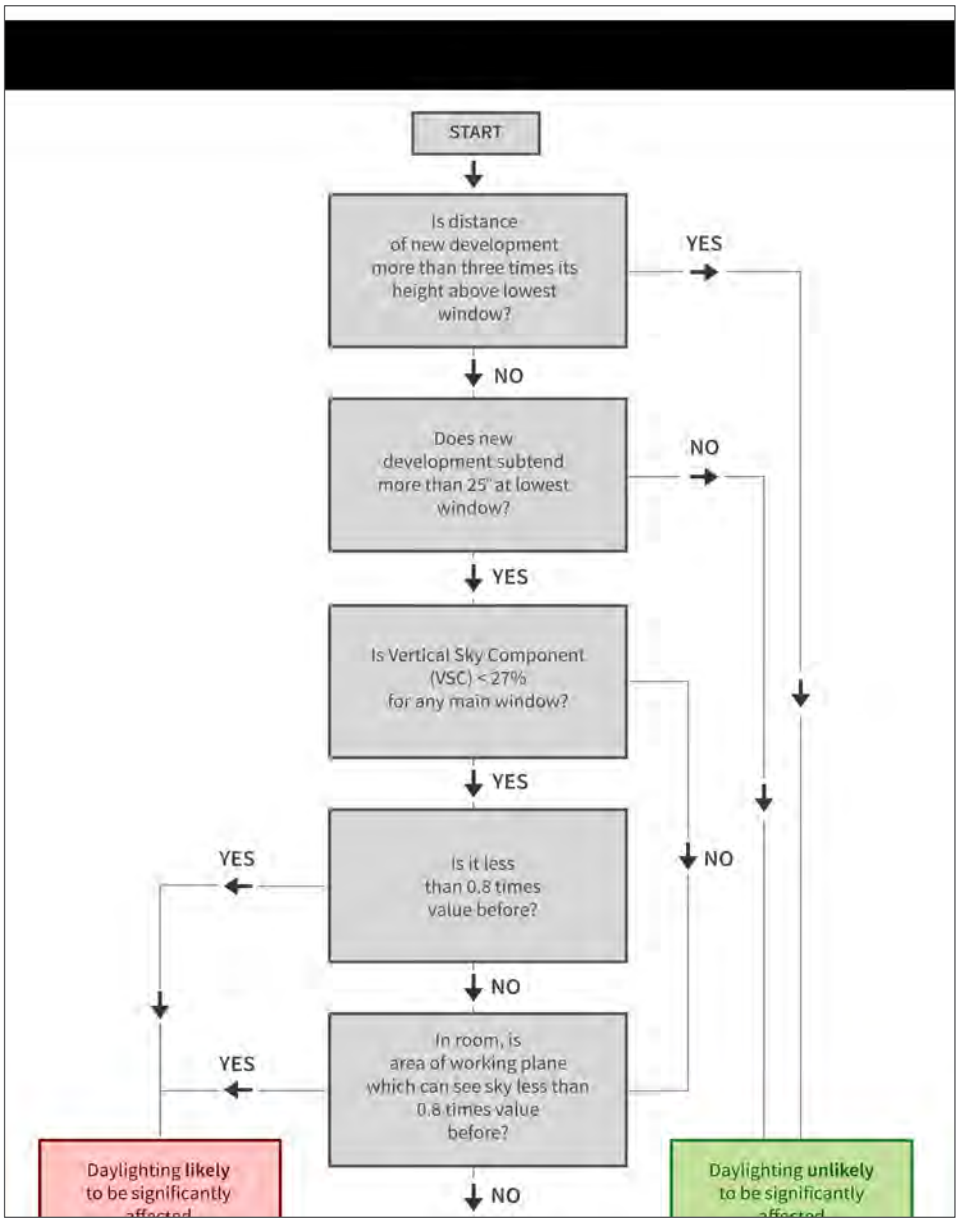



**Figure 3: Decision Chart - Daylight in Existing Buildings (BRE Guidance)**

**3.8** It should be noted that this assessment has not taken into account 'Right to Light' which is not a material planning consideration.

# Sunlight: Existing Dwellings

**3.9** The BRE provides guidance in respect of sunlight quality for existing buildings within section 3.2 of the handbook. It is generally acknowledged that the presence of sunlight is more valuable in residential accommodation than it is in commercial, and this is reflected in the BRE document.

**3.10** So as to quantify sunlight access for interiors where sunlight is expected, it refers to the BS 8206-2 criterion of Annual Probable Sunlight Hours (APSH). 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 or at the centre point of the window (typically 1.6m above the ground on the lowest storey level).

**3.11** The BRE guidance states that obstruction to sunlight may become an issue if some part of a new development is situated within 90° of due south of a main window wall of an existing building. The summary of section 3.2 of the guide states the following:

*"If a living room of an existing dwelling has a main window facing 90° of due south, and any part of a new development subtends an angle of more than 25° to the horizontal measured from the centre of the window in a vertical section perpendicular to the window, then the sunlighting of the existing dwelling may be adversely affected. This will be the case if the centre of the window:*

- *Receives less than 25% of annual probable sunlight hours, or less than 5% of probable sunlight hours between 21 September and 21 March, and;*
- *Receives less than 0.8 times its former sunlight hours during either period, and;*
- *Has a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours."*

**3.12** The guidance suggests that to assess loss of sunlight to an existing building, main living rooms and conservatories should be checked if they have a window facing within 90° of due south.

**3.13** 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 it is excluded.

# Overshadowing: Gardens and Amenity Space

**3.14** Transient overshadowing diagrams for critical dates and times throughout the year (winter and summer solstices, spring and autumn equinoxes) are useful visual indicators of the expected shading effect of the proposed massing on the neighbouring fabric. In interpreting the impact of shadowing it is important to note that nearly all structures will create areas of new shadow, and some degree of transient overshadowing of a space is to be expected.

**3.15** The analysis does not take into account shading by natural vegetation such as trees. It is stated within the BRE guidance that for daylighting assessments it is usual to ignore the effect of existing or proposed trees because of their irregular shapes and also because some light will generally penetrate through the tree crown.

# Site Information

**3.16** The site is currently private open ground and is not accessible to the wider community. The existing sports pavilion is located to the west of the site, and is proposed for refurbishment.

**3.17** It is bound to the south by Cromwell Road, to the north by existing dwellings, to the west by the Udney Park Road and to the east by Kingston Lane. The site lies in a residential area of Teddington and is a short walk from Teddington High Street.

**3.18** The development proposals include the following:

> New GP surgery;

> Plot A – 92 Extra Care living apartments, communal facilities, health and beauty salon, offices and treatment rooms, restaurant, bar & multi-functional rooms;

> Plot B – Full high-specification refurbishment of the existing clubhouse to provide 7 Extra Care living apartments & 1 visitor suite;

> Plot C – 9 Extra Care living apartments;

> New Clubhouse, cafe and sports facilities.

**3.19** The proposed development site plan is set out in the indicative image in Figure 4 overleaf, as extracted from the public exhibition panels . The main Extra Care assisted living units are located to the north-west of the site, and the main sports area is located to the south.


**Figure 4: Proposed Development (Source: Former ICL - Final Public Exhibition)**

## Sources of Data

**3.20** The following sources of data have been used to set-up the site, existing and proposed development 3D models:

> Site photography collected during a site survey conducted on 11 May 2017 (Appendix D);

> Detailed 3D SketchUp model of existing site conditions and proposed development provided by Quantum Group;

> Architectural drawings (plans, sections & elevations) received from Quantum Group on 20 May 2017.

## Software

**3.21** Specialist 3D modelling and daylighting software has been used to predict daylight and sunlight projection across an assessed plane, Vertical Sky Component and internal daylight levels for the proposed dwellings. The market accredited and validated Radiance calculation engine has been used for the calculation of the Average Daylight Factor.

## Simulation Inputs

**3.22** Light coloured materials are agreed to be used in order to maximise the internal surface internal values. Medium coloured external surfaces have also been assumed. Light transmittance values of the glazing have been specified in accordance with the proposed g-values mentioned in the Energy Statement by Hodkinson Consultancy, aiming to establish realistic product market specifications.

**3.23** Common market products were used and assumptions were made in accordance with the BS 8206-2:2008, Annex A, Tables A.1-A.6 for the calculation of the Average Daylight Factor. These are presented in **Appendix B**.

# 4. DAYLIGHT ASSESSMENT: PROPOSED DEVELOPMENT

**4.1** An assessment of the daylight received by rooms within the proposed development has been carried out using the Average Daylight Factor (ADF).

**4.2** 13 out of the 108 dwellings of the proposed development, accounting for the 12%, were assessed against the recommended ADF targets for each habitable room. The selection deems the dwellings as a representative unit-mix across the development based on:

> **Their floor level**: Dwellings from different floors have been assessed, ranging from basement floor flats to higher floor flats;

> **Their internal layouts and façade design**: the assessment includes all unit typologies (1-beds and 2-beds).

**4.3** The typologies are similar for all blocks, therefore results can be considered applicable for the rest of the development.

**4.4** The apartment layouts have been modelled along with the position and size of relevant windows which service habitable rooms, based on the elevation and section drawings provided by Quantum Group. Modelling of surrounding dwellings has also been incorporated to account for any buildings which may impede daylight amenity.

**4.5** The results of the ADF tests for the apartment tested are displayed within the table in the following section.

# Simulated Average Daylight Factor Results

**4.6** The BRE guidance and British Standards (BS 8206-2) recommends a minimum ADF of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms. For open-plan spaces the target ADF is accounted as the higher one, e.g. for an open-plan living-room / kitchen space or for the target ADF value would be 2%.

**4.7** However, since the guidance clearly states that numerical benchmarks should be interpreted flexibly depending on the specific context of each development, it should be considered acceptable in larger building blocks to achieve an ADF value of 1.5% in single-aspect open-plan living room / dining / kitchen areas.

**4.8** Table 2 below shows the ADF results in respect of the proposed development. Results show that 26 out of the 33 (78%) assessed habitable rooms present acceptable internal daylighting levels achieving relevant ADFs higher than 1.0% for bedrooms or higher than 1.5% for open plan living rooms / dining / kitchen areas, indicating the sufficient levels of internal daylight across the development, which the occupants will experience.

**4.9** It is important to note that the principal living area is closer to the main window wall where perception of daylight will be at its highest (**Appendix C**). These rooms are also situated beneath inset balconies which obstruct light from high level, but do provide the occupant with the amenity

of an outdoor space and relevant sense of privacy, and also help mitigate against summer overheating.

**4.10** The single aspect open-plan Living – Dining – Kitchen configuration normally lowers the ADF results, but serves well the modern new build arrangement and the architectural functionality. In addition, due to specific site arrangement single aspect dwelling typologies were unavoidable and dual aspect rooms have been maximised where possible.

**Table 2: Average Daylight Factor**

| **Dwellings - Assessed** | | | | |
|---|---|---|---|---|
| | | **Actual ADF %** | **Target ADF %** | **Assessment Result** |
| **Lower Ground Floor** | | | | |
| **AB01** | Bedroom 1 | 0.6 | 1.0 | Below Target |
| | Living / Dining Room | 3.3 | 2.0 | Above Target |
| **EB02** | Bedroom 1 | 2.2 | 1.0 | Above Target |
| | Bedroom 2 | 1.3 | 1.0 | Above Target |
| | Living – Dining – Kitchen | 3.1 | 2.0 | Above Target |
| **CB01** | Bedroom 1 | 3.3 | 1.0 | Above Target |
| | Bedroom 2 | 0.9 | 1.0 | Below Target |
| | Living – Dining – Kitchen | 1.6 | 2.0 | Acceptable |
| **CB02** | Bedroom 1 | 2.0 | 1.0 | Above Target |
| | Living – Dining – Kitchen | 1.4 | 2.0 | Below Target |
| **Ground Floor** | | | | |
| **B001** | Bedroom 1 | 1.0 | 1.0 | Above Target |
| | Bedroom 2 | 1.4 | 1.0 | Above Target |
| | Living – Dining – Kitchen | 1.4 | 2.0 | Below Target |
| **B004** | Bedroom 1 | 1.7 | 1.0 | Above Target |
| | Living – Dining – Kitchen | 1.2 | 2.0 | Below Target |
| **Plot B - Ground floor, south dwelling** | Bedroom 1 | 3.4 | 1.0 | Above Target |
| | Bedroom 2 | 2.3 | 1.0 | Above Target |
| | Living – Dining – Kitchen | 3.0 | 2.0 | Above Target |
| **First Floor** | | | | |
| **A106** | Bedroom 1 | 2.3 | 1.0 | Above Target |
| | Living – Dining – Kitchen | 0.8 | 2.0 | Below Target |
| **A105** | Bedroom 1 | 2.8 | 1.0 | Above Target |
| | Bedroom 2 | 2.1 | 1.0 | Above Target |
| | Living – Dining – Kitchen | 1.0 | 2.0 | Below Target |
| **C103** | Bedroom 1 | 2.0 | 1.0 | Above Target |
| | Living – Dining – Kitchen | 2.2 | 2.0 | Above Target |

| Second Floor | | | | |
|---|---|---|---|---|
| A208 | Bedroom 1 | 2.1 | 1.0 | Above Target |
| | Living – Dining – Kitchen | 3.6 | 2.0 | Above Target |
| B201 | Bedroom 1 | 2.2 | 1.0 | Above Target |
| | Bedroom 2 | 2.1 | 1.0 | Above Target |
| | Living – Dining – Kitchen | 2.7 | 2.0 | Above Target |
| E204 | Bedroom 1 | 4.1 | 1.0 | Above Target |
| | Bedroom 2 | 1.8 | 1.0 | Above Target |
| | Living – Dining – Kitchen | 2.8 | 2.0 | Above Target |

# 5. DAYLIGHT ASSESSMENT: EXISTING DWELLINGS

## Distance

**5.1** Loss of light to existing windows need not be analysed if the distance of each part of the new development from the existing window is three or more times its height above the centre of the existing window.

**5.2** The New Clubhouse, cafe and sports facilities building which is located on the southern part of the site falls into this category as the distance is measured as approximately 40m from the south and 43m from the west existing buildings.

## 25° Plane Rule

**5.3** BRE guidance advises that if the angle to the horizontal subtended by the new development at the level of the centre of the lowest window is less than 25° then it is unlikely to have a substantial effect on the diffuse skylight enjoyed by the existing building. If, for any part of the new development, this angle is more than 25°, a more detailed check is required.

**5.4** Figures 5 & 6 below show the 25° angle as drawing from a height of 1.6m above ground, as suggested in BRE Guidance in cases where exact window location and size information is unavailable. It can be seen that none of the neighbouring dwellings, except from one dwelling located on the southeast corner of the site, will be affected by the proposed development since this is not subtending the 25° angle.

**5.5** Since the profile of the proposed building subtends an angle greater than 25° for the neighbouring dwelling on the south west corner of the site (Figure 6, right hand side), then the VSC test is to be applied in order to investigate the level of harm further.

**Figure 5: Proposed Development Generic View with 25° obstruction angle**

**Figure 6: Proposed Development Views with 25° obstruction angle**

# Vertical Sky Component Analysis

**5.6** The Vertical Sky Component is a way of quantifying the amount of skylight falling on a vertical wall or window. It is a ratio of the direct sky illuminance falling on the vertical wall at a reference point (centre of the window), to the simultaneous horizontal illuminance under an unobstructed sky. The maximum value is almost 40% for a completely unobstructed vertical wall. The BRE guidance suggests that if the VSC is greater than 27% then enough skylight should still be reaching the window in question and as such the occupants of the existing building are unlikely to notice any reduction in skylight. If the VSC, with the new development in place, is both less than 27% and less than 0.8 times its former value (prior to the development), occupants of the existing building will likely notice the reduction in the amount of skylight.

**5.7** VSC results have been generated for the north façade windows of the neighbouring residential property located in the south west corner of the site.

**5.8** Following the site survey, it was identified that an existing fence was located in front of the affected façade, making it hard to measure or estimate the exact size and location of windows (Figure 7).

**Figure 7: Site survey photo of the north façade of the affected neighbouring building**

**5.9** For the purposes of the assessment it is assumed that there are three windows in total, as shown in Figure 8 below.

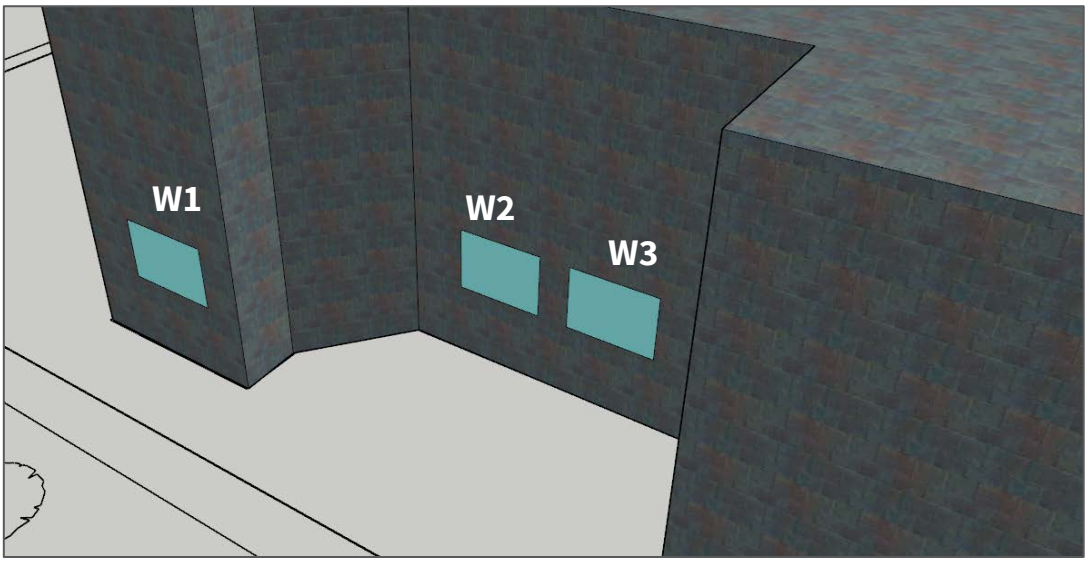



**Figure 8: 3D model of the neighbouring dwelling showing assumed window locations**

**5.10** The BRE Guidance suggests that obstructions with a temporary character such as fences should not be included in the assessment. The VSC test has been carried out based on this guidance but it would seem reasonable to also carry out the test based on the local condition identified during the site survey. Therefore, Table 3 below shows the VSC results with and without the existing fence.

**Table 3: Vertical Sky Component Analysis**

| Assessed Neighbouring Windows | EXISTING VSC (%) | PROPOSED VSC (%) | LOSS | ORIGINAL VALUE |
|---|---|---|---|---|
| **Fence not included** | | | | |
| Window 1 | 39.60 | 18.95 | 20.35 | 48.61% |
| Window 2 | 32.25 | 18.00 | 12.60 | 60.93% |
| Window 3 | 29.90 | 16.55 | 12.60 | 60.93% |
| **Fence included** | | | | |
| Window 1 | 5.70 | 5.70 | 0.00 | 100.00% |
| Window 2 | 21.15 | 17.45 | 3.60 | 82.90% |
| Window 3 | 19.35 | 17.45 | 3.60 | 82.90% |

**5.11** Table 3 shows that, according to the BRE Guidance, the three windows achieve a VSC of less than 27% and lower than 0.8 times its former value, indicating that occupants of the existing building will be likely to notice the reduction in the amount of skylight. However, taking into account the

current local conditions, the amount of skylight with the proposed development in place is only slightly affected.

# 6. SUNLIGHT ASSESSMENT: EXISTING DWELLINGS

**6.1** An assessment of sunlight onto individual windows of the existing neighbouring dwellings should be carried out using the Annual Probable Sunlight Hours (APSH) and Winter Probable Sunlight Hours calculation. This is to ensure existing residents will continue to benefit from adequate levels of sunlight once the proposed development has been built.

**6.2** Windows that require sunlight assessment, using the Annual Probable Sunlight Hours (APSH) metric, are those that face within 90° of due south. A full sunlight assessment is not necessary if:

> The distance of each part of the new development from the existing window is three or more times its height above the centre of the existing window (NB no obstructions within 90° of due north of the existing window need not count here);

> The window wall faces within 90° of due south and no obstruction (measured in the section of the perpendicular to the window wall) subtends an angle of more than 25° to the horizontal. Again, obstructions within 90° of due north of the existing window need not be counted;

> The window wall faces within 20° of due south and the reference point has a VSC of 27% or more.

**6.3** Since the affected façade of the neighbouring dwelling is facing north, a full sunlight assessment in not considered necessary.

# 7. OVERSHADOWING ASSESSMENT: GARDENS AND AMENITY SPACES

**7.1** BRE guidance stipulates that where large buildings are proposed it is often illustrative to plot a shadow plan showing the location of shadows at different times of day and year.

**7.2** Shadow plots have been generated using SketchUp for three periods within the year, summer solstice (21st June), spring/autumn equinox (21st September) and winter solstice (21st December) to illustrate the amount of shadow experienced throughout the year around the development accounting for high, low and mid-year sun angles.

**7.3** The shadow plot diagrams shown in Figure 9 indicate that for the majority of the year the garden and amenity space of the proposed development remains unaffected.

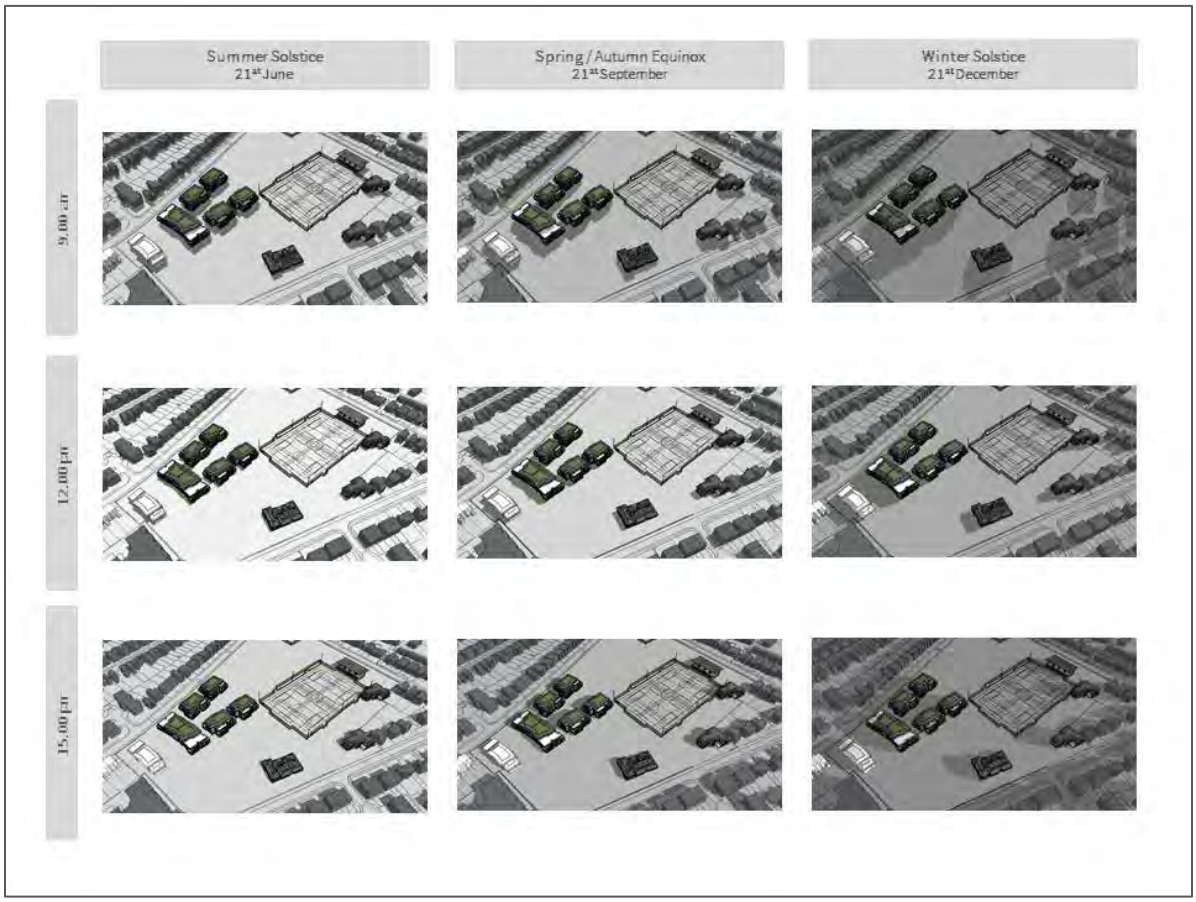



**Figure 9: Transient Overshadowing**

**7.4** As expected, the overshadowing effect becomes more intense at the north east and north west of the proposed development during the winter months when the sun angle is low.

**7.5** Each shadow plot image is also included in **Appendix E**.

**7.6** In interpreting the impact of overshadowing, it is important to note that nearly all structures will create areas of new shadow, and some degree of transient overshadowing of a space is to be expected.

# 8. CONCLUSION

**8.1** Hodkinson Consultancy has been instructed by Quantum Group to assess the impact of the proposed development at Former ICL Private Ground in the London Borough of Richmond Upon

Thames upon daylight and sunlight amenity for existing dwellings surrounding the site, and to demonstrate the predicted internal daylight levels of the proposed dwellings.

**8.2** This report fully considers the methodology of the publication of the second edition of the BRE Guidelines 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice' (2011) and has also been prepared in line with British Standards 8206. The BRE guidance stated that it is intended for designers and their clients, consultants and planning officials. The guidance is not mandatory and states that it should not be seen as an instrument of planning policy.

**8.3** Therefore, failure to achieve the stated target numerical factors does not necessarily mean that the development is unsuitable or that planning permission should be refused.

**8.4** The report includes the following assessments and findings in relation to the proposed development:

## Average Daylight Factor Assessment: Proposed Dwellings

> An internal daylight assessment using the Average Daylight Factor metric (ADF), has been undertaken for thirteen (13) representative dwellings of the proposed development, which accounts for 12% of the unit-mix. Simulated results show that 78% of the assessed habitable rooms present acceptable levels of internal daylighting.

## Daylight & Sunlight Assessment: Existing Dwellings

> The proposed development does not subtend the 25° obstruction angle for any of the neighbouring windows apart from one dwelling, indicating that the diffuse daylighting of the existing buildings will not be significantly affected by the proposed development.

> The BRE VSC criteria were assessed for the north façade of the dwelling for which the proposed development subtends the 25° obstruction angle. Based on the BRE Guidance three assumed windows fail to meet the suggested VSC criteria, however, the criteria are met when the model takes into account the local fence located in front of the assessed windows.

## Overshadowing Assessment: Gardens and Amenity Space

> The shadow plot diagrams indicate that for the majority of the year the garden and amenity space of the proposed development remains unaffected.

> The overshadowing effect becomes more intense at the north east and north west of the proposed development during the winter months when the sun angle is low.

# 9. GLOSSARY

**9.1** The following terms are referenced throughout the report. They are described below as stated in the BRE guidance:

> **Average Daylight Factor (ADF)**: Ratio of total daylight flux incident on the working plane to the area of the working plane, expressed as a percentage of the outdoor illuminance on a horizontal plane due to an unobstructed CIE standard overcast sky. Thus a 1%ADF would mean that the average indoor illuminance would be one hundredth the outdoor unobstructed illuminance.

> **Daylight**: Combined skylight and sunlight.

> **Obstruction Angle**: The angular altitude of the top of an obstruction above the horizontal, measured from a reference point in a vertical plane in a section perpendicular to the vertical plane.

> **Probable Sunlight Hours**: The long-term average of the total number of hours during a year in which direct sunlight reaches the unobstructed ground.

> **Vertical Sky Component (VSC)**: Ratio of that part of illuminance, at a point on a given vertical plan, that is received directly from an overcast sky, to illuminance on a horizontal plane due to an unobstructed hemisphere of this sky.

> **No Sky Line**: The No Sky Line divides those areas of the working plane which can receive direct skylight, from those which cannot. It indicates how good the distribution of daylight is in a room.

> **Working Plane:** Horizontal, vertical or inclined plane in which a visual task lies. Normally the working plane may be taken to be horizontal, 0.85m above the floor in houses and factories, 0.7m above the floor in offices.

# APPENDICES

## Appendix A: Site Layout Drawings

## Appendix B: ADF Simulation Inputs & Assumptions

## Appendix C: ADF Contours

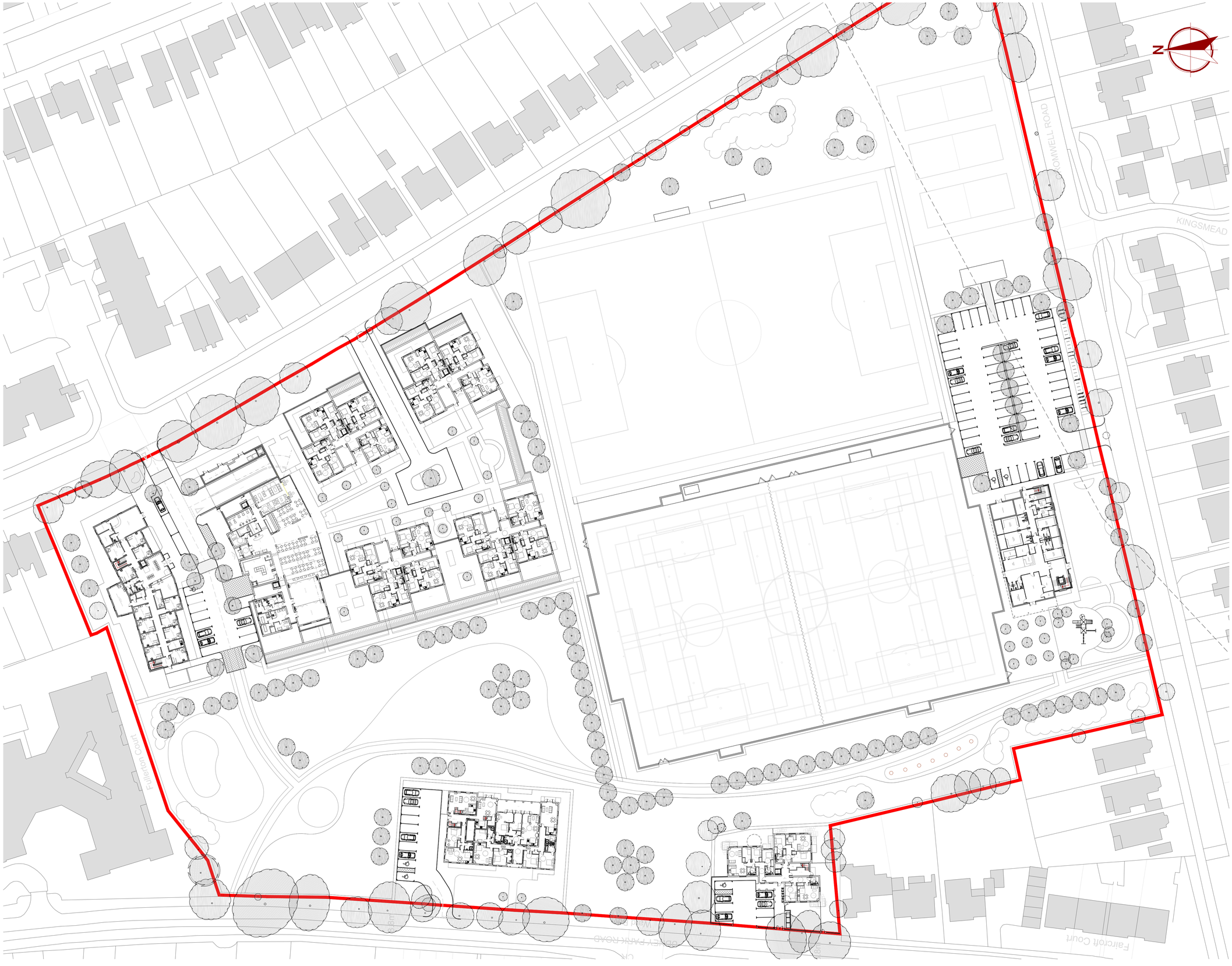
## Appendix D: Site Survey Photography

## Appendix E: Transient Overshadowing Diagrams

# Appendix A

## Site Layout Drawings

When Scaled correctly this bar measures 100mm.




# PLANNING

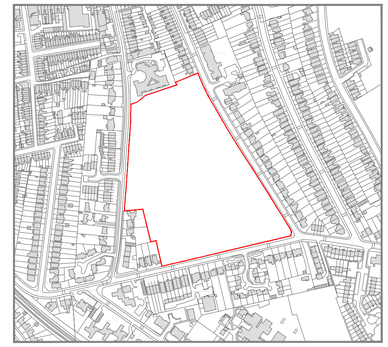


Do Not Scale, Use figure dimensions.

Check all dimensions on site before work proceeds, report discrepancies to Architect.

If In Doubt Ask!!

NOTES:



Location Plan - 1:5000

| Rev | Date | Description | Initials |
|---|---|---|---|

Quantum Group

Quantum House, 170 Charminster Road, Charminster, Bournemouth, BH8 9RL
Email: info@quantumhomes.co.uk | Web: www.quantumhomes.co.uk
Tel: 01202 531635 | Fax: 01202 531650

Project:

Former Imperial College Private Ground , Udney Park Road, Teddington

Drawing Title:

Proposed Site Plan

Discipline:

ARCHITECTURAL

| Drawn by: | Checked by: |
|---|---|
| JC | SH |

| Scale: | Date: |
|---|---|
| 1:500@A1 | July 2017 |

Drawing Number: 900-SK02

Revision: .

When Scaled correctly this bar measures 100mm.

0m
1:200
10m
20m
30m

# PLANNING

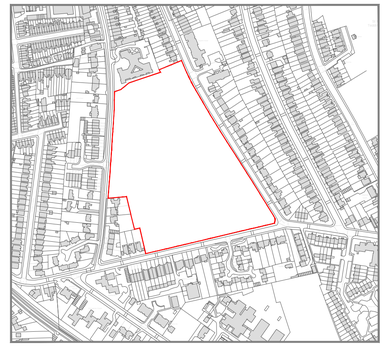


Do Not Scale, Use figure dimensions.

Check all dimensions on site before work proceeds, report discrepancies to Architect.

If In Doubt Ask!!

NOTES:



Location Plan - 1:5000

| Rev | Date | Description | Initials |
|---|---|---|---|

Quantum Group

Quantum House, 170 Charminster Road, Charminster, Bournemouth, BH8 9RL
Email: info@quantumhomes.co.uk | Web: www.quantumhomes.co.uk
Tel: 01202 531635 | Fax: 01202 531650

Project:

Former Imperial College Private Ground , Udney Park Road, Teddington

Drawing Title:

Plot A - Apartments Proposed Basement Floor Plan

Discipline:

ARCHITECTURAL

Drawn by: PL

Checked by: SH

Scale: 1:200@A1

Date: July 2017

Drawing Number: 900-SK05

Revision: .

When Scaled correctly this bar measures 100mm.


0m
1:100
5m
10m
15m

# PLANNING

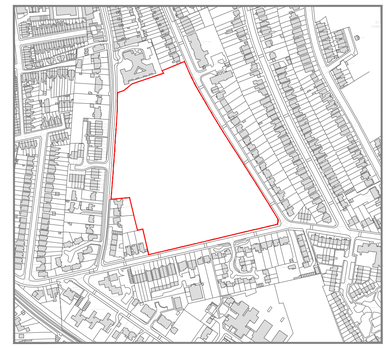


Do Not Scale, Use figure dimensions.

Check all dimensions on site before work proceeds, report discrepancies to Architect.

If In Doubt Ask!!

NOTES:



Location Plan - 1:5000

| Rev | Date | Description | Initials |
|---|---|---|---|

Quantum Group

Quantum House, 170 Charminster Road, Charminster, Bournemouth, BH8 9RL
Email: info@quantumhomes.co.uk | Web: www.quantumhomes.co.uk
Tel: 01202 531635 | Fax: 01202 531650

Project:

Former Imperial College
Private Ground , Udney Park
Road, Teddington

Drawing Title:

Plot A - Apartments
Proposed Ground Floor Plan

Discipline:

ARCHITECTURAL

Drawn by: JC - PL

Checked by: SH

Scale: 1:200@A1

Date: July 2017

Drawing Number: 900-SK06

Revision: .

When Scaled correctly this bar measures 100mm.


0m
1:200
10m
20m
30m

# PLANNING

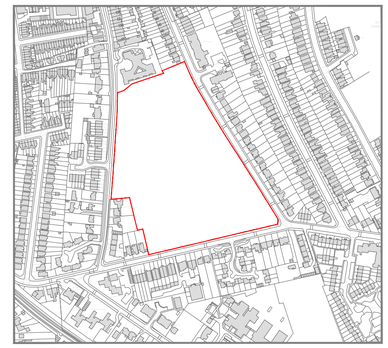


Do Not Scale, Use figure dimensions.

Check all dimensions on site before work proceeds, report discrepancies to Architect.

If In Doubt Ask!!

NOTES:



Location Plan - 1:5000

| Rev | Date | Description | Initials |
|---|---|---|---|

Quantum Group

Quantum House, 170 Charminster Road, Charminster, Bournemouth, BH8 9RL
Email: info@quantumhomes.co.uk | Web: www.quantumhomes.co.uk
Tel: 01202 531635 | Fax: 01202 531650

Project:

Former Imperial College Private Ground , Udney Park Road, Teddington

Drawing Title:

Plot A - Apartments
Proposed First Floor Plan

Discipline:

ARCHITECTURAL

Drawn by: JC - PL

Checked by: SH

Scale: 1:200@A1

Date: July 2017

Drawing Number: 900-SK07

Revision: .

When Scaled correctly this bar measures 100mm.


0m
1:200
10m
20m
30m

# PLANNING

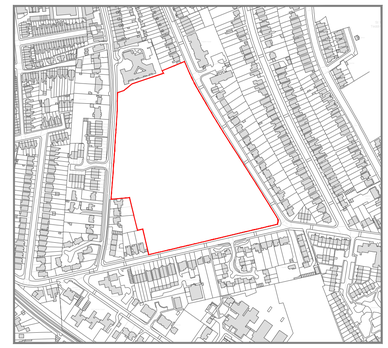


Do Not Scale, Use figure dimensions.

Check all dimensions on site before work proceeds, report discrepancies to Architect.

If In Doubt Ask!!

NOTES:



Location Plan - 1:5000

| Rev | Date | Description | Initials |
|---|---|---|---|

Quantum Group

Quantum House, 170 Charminster Road, Charminster, Bournemouth, BH8 9RL
Email: info@quantumhomes.co.uk | Web: www.quantumhomes.co.uk
Tel: 01202 531635 | Fax: 01202 531650

Project:

Former Imperial College Private Ground , Udney Park Road, Teddington

Drawing Title:

Plot A - Apartments
Proposed Second Floor Plan

Discipline:

ARCHITECTURAL

Drawn by: JC - PL

Checked by: SH

Scale: 1:200@A1

Date: July 2017

Drawing Number: 900-SK08

Revision: .

When Scaled correctly this bar measures 100mm.


# PLANNING

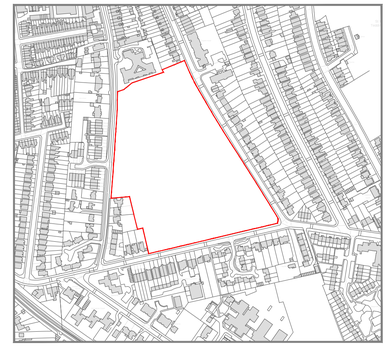


Do Not Scale, Use figure dimensions.

Check all dimensions on site before work proceeds, report discrepancies to Architect.

If In Doubt Ask!!

NOTES:



Location Plan - 1:5000

| Rev | Date | Description | Initials |
|---|---|---|---|

Quantum Group

Quantum House, 170 Charminster Road, Charminster, Bournemouth, BH8 9RL
Email: info@quantumhomes.co.uk | Web: www.quantumhomes.co.uk
Tel: 01202 531635 | Fax: 01202 531650

Project:

Former Imperial College Private Ground , Udney Park Road, Teddington

Drawing Title:

Plot A - Apartments
Proposed Third Floor Plan

Discipline:

ARCHITECTURAL

Drawn by: JC - PL

Checked by: SH

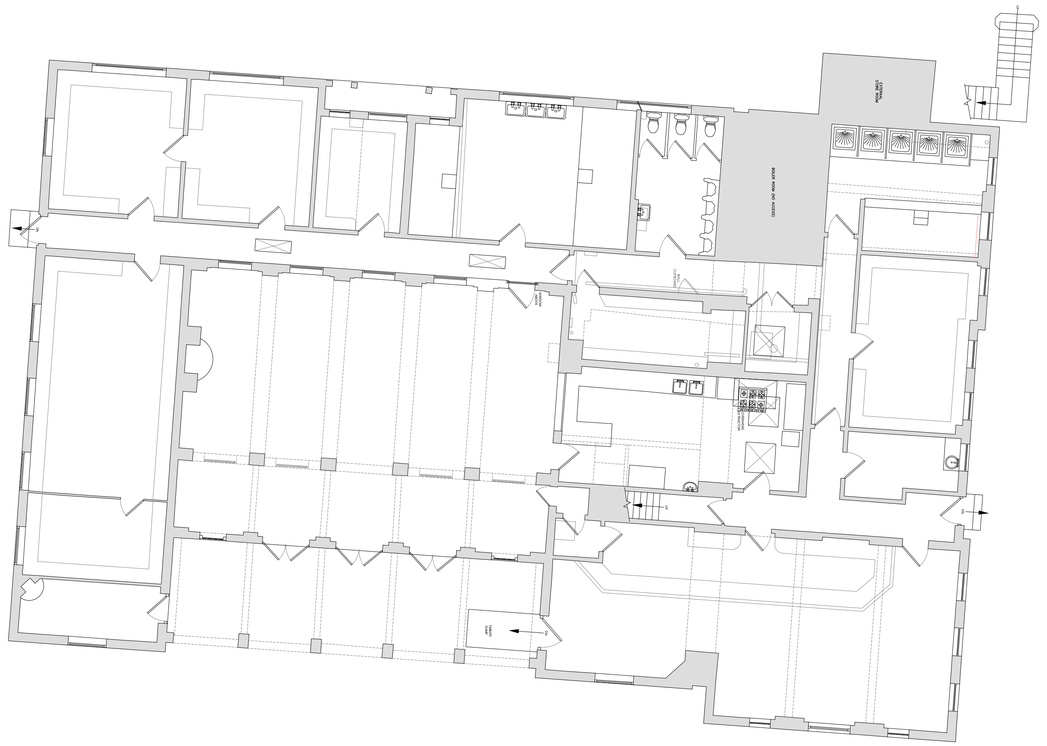
Scale: 1:200@A1

Date: July 2017

Drawing Number: 900-SK09

Revision: .

When Scaled correctly this bar measures 100mm.




0m 5m 10m 15m
1:100

# PLANNING

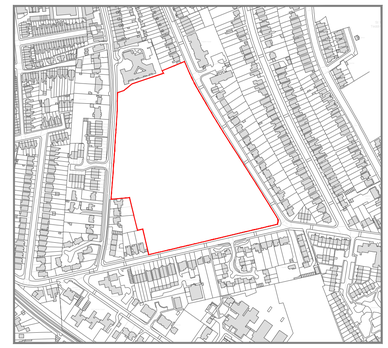


Do Not Scale, Use figure dimensions.

Check all dimensions on site before work proceeds, report discrepancies to Architect.

If In Doubt Ask!!

NOTES:



Location Plan - 1:5000

| Rev | Date | Description | Initials |
|---|---|---|---|

Quantum Group

Quantum House, 170 Charminster Road, Charminster, Bournemouth, BH8 9RL
Email: info@quantumhomes.co.uk | Web: www.quantumhomes.co.uk
Tel: 01202 531635 | Fax: 01202 531650

Project:

Former Imperial College Private Ground , Udney Park Road, Teddington

Drawing Title:

Plot B - Existing Club House Existing Ground Floor Plan

Discipline:

ARCHITECTURAL

Drawn by: JC

Checked by: SH

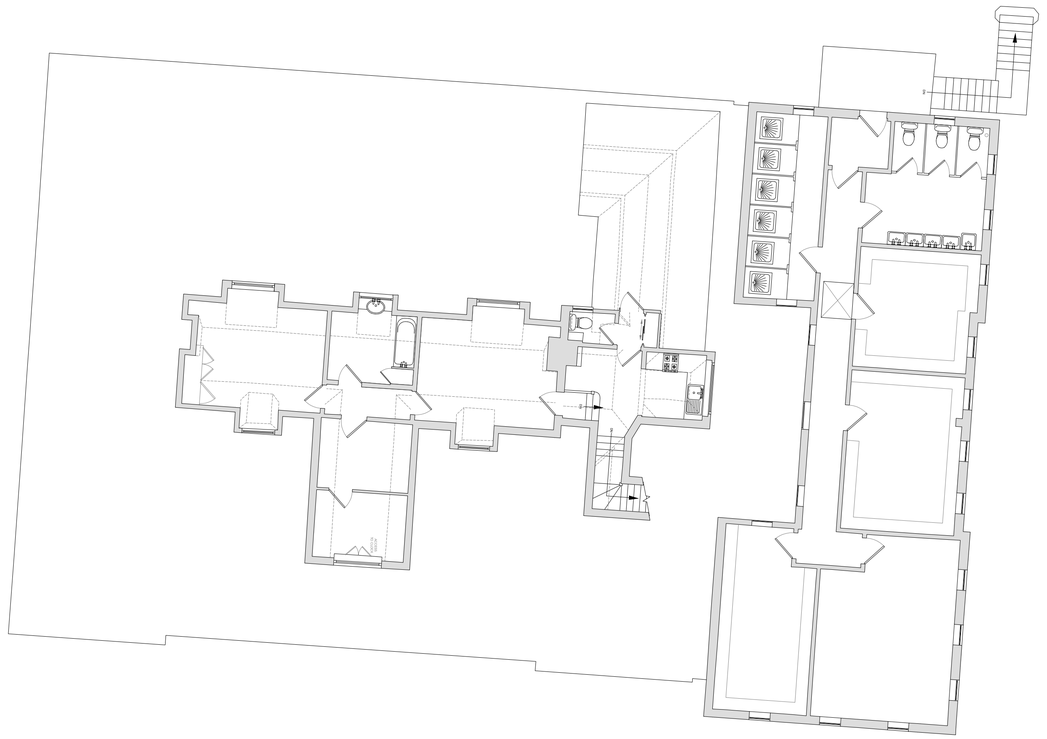
Scale: 1:100@A1

Date: July 2017

Drawing Number: 900-SK12

Revision: .

When Scaled correctly this bar measures 100mm.



0m
1:100
5m
10m
15m

# PLANNING

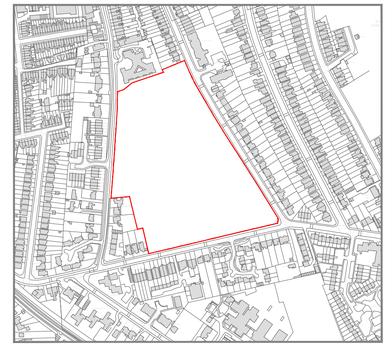


Do Not Scale, Use figure dimensions.

Check all dimensions on site before work proceeds, report discrepancies to Architect.

If In Doubt Ask!!

NOTES:



Location Plan - 1:5000

| Rev | Date | Description | Initials |
|---|---|---|---|

Quantum Group

Quantum House, 170 Charminster Road, Charminster, Bournemouth, BH8 9RL
Email: info@quantumhomes.co.uk | Web: www.quantumhomes.co.uk
Tel: 01202 531635 | Fax: 01202 531650

Project:

Former Imperial College Private Ground , Udney Park Road, Teddington

Drawing Title:

Plot B - Existing Club House Existing First Floor Plan

Discipline:

ARCHITECTURAL

Drawn by: JC

Checked by: SH

Scale: 1:100@A1

Date: July 2017

Drawing Number: 900-SK13

Revision: .

When Scaled correctly this bar measures 100mm.

# PLANNING

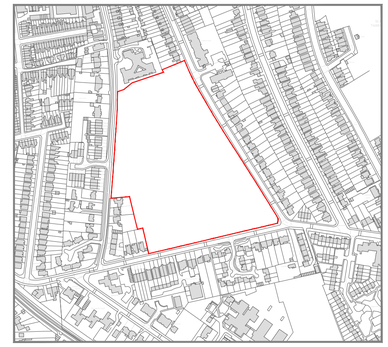


Do Not Scale, Use figure dimensions.

Check all dimensions on site before work proceeds, report discrepancies to Architect.

If In Doubt Ask!!

NOTES:



Location Plan - 1:5000

| Rev | Date | Description | Initials |
|---|---|---|---|

Quantum Group

Quantum House, 170 Charminster Road, Charminster, Bournemouth, BH8 9RL
Email: info@quantumhomes.co.uk | Web: www.quantumhomes.co.uk
Tel: 01202 531635 | Fax: 01202 531650

Project:

Former Imperial College Private Ground , Udney Park Road, Teddington

Drawing Title:

Plot B - Existing Club House Proposed Ground Floor Plan

Discipline:

ARCHITECTURAL

Drawn by: JC

Checked by: SH

Scale: 1:100@A1

Date: July 2017

Drawing Number: 900-SK15

Revision: .

0m 5m 10m 15m
1:100

When Scaled correctly this bar measures 100mm.

# PLANNING

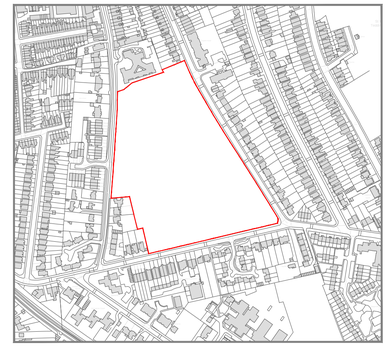


Do Not Scale, Use figure dimensions.

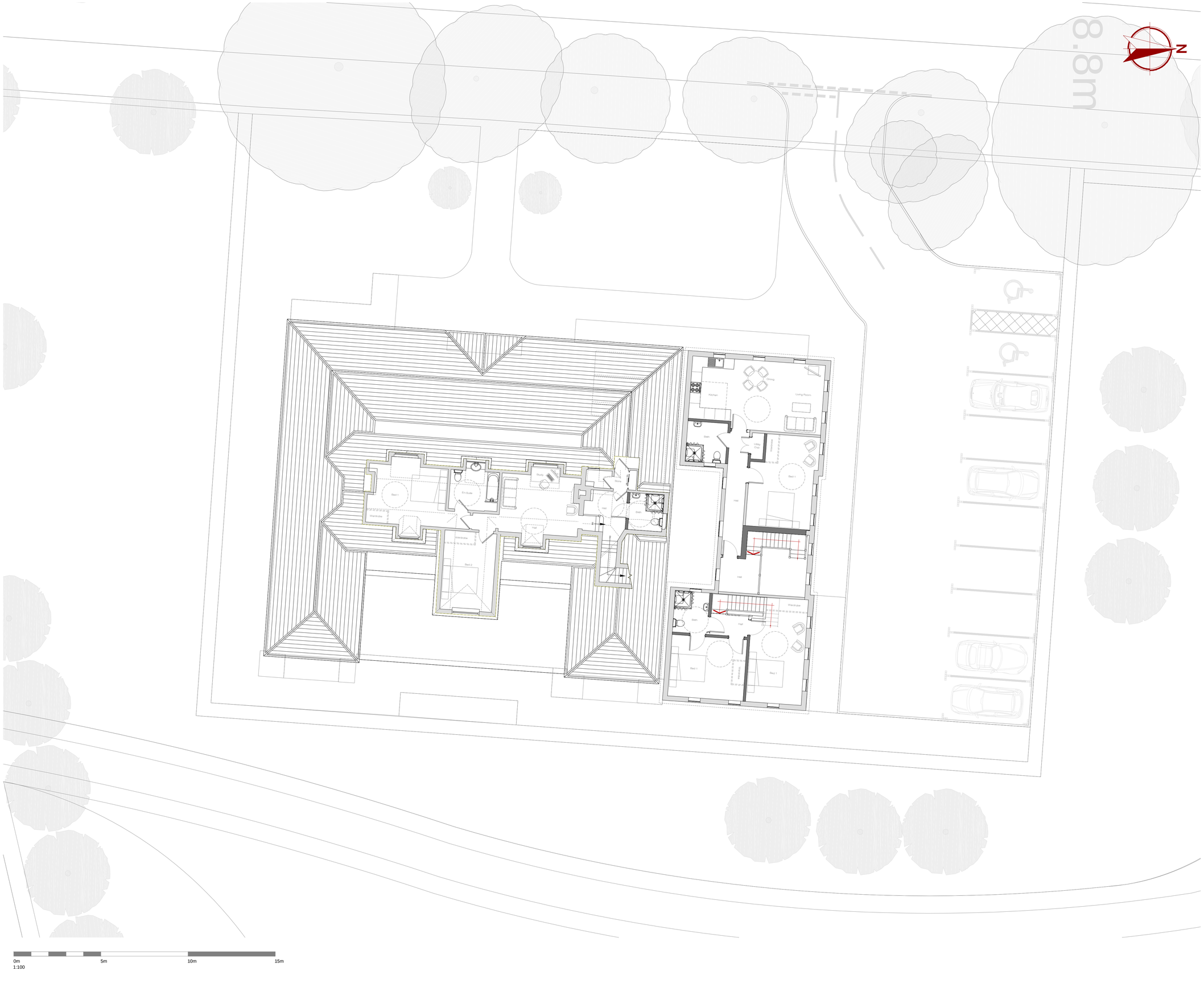
Check all dimensions on site before work proceeds, report discrepancies to Architect.

If In Doubt Ask!!

NOTES:



Location Plan - 1:5000




0m 5m 10m 15m
1:100

| Rev | Date | Description | Initials |
|---|---|---|---|

Quantum Group

Quantum House, 170 Charminster Road, Charminster, Bournemouth, BH8 9RL
Email: info@quantumhomes.co.uk | Web: www.quantumhomes.co.uk
Tel: 01202 531635 | Fax: 01202 531650

Project:

Former Imperial College Private Ground , Udney Park Road, Teddington

Drawing Title:

Plot B - Existing Club House Proposed First Floor Plan

Discipline:

ARCHITECTURAL

| Drawn by: | Checked by: |
|---|---|
| JC | SH |

| Scale: | Date: |
|---|---|
| 1:100@A1 | July 2017 |

Drawing Number: 900-SK16

Revision: .

When Scaled correctly this bar measures 100mm.


0m 5m 10m 15m
1:100

# PLANNING

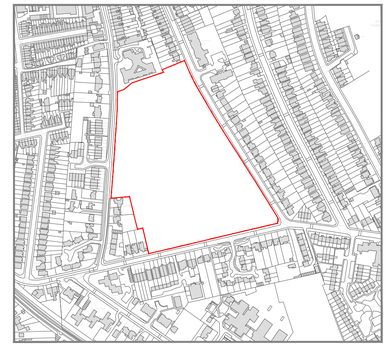


Do Not Scale, Use figure dimensions.

Check all dimensions on site before work proceeds, report discrepancies to Architect.

If In Doubt Ask!!

NOTES:



Location Plan - 1:5000

| Rev | Date | Description | Initials |
|---|---|---|---|

Quantum Group

Quantum House, 170 Charminster Road, Charminster, Bournemouth, BH8 9RL
Email: info@quantumhomes.co.uk | Web: www.quantumhomes.co.uk
Tel: 01202 531635 | Fax: 01202 531650

Project:

Former Imperial College Private Ground , Udney Park Road, Teddington

Drawing Title:

Plot C - Existing Car Park Proposed Ground Floor Plan

Discipline:

ARCHITECTURAL

Drawn by: JC

Checked by: SH

Scale: 1:100@A1

Date: July 2017

Drawing Number: 900-SK18

Revision: .

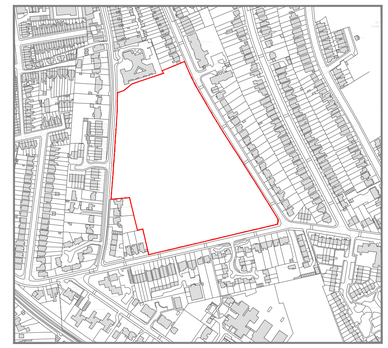
When Scaled correctly this bar measures 100mm.


0m 5m 10m 15m
1:100

# PLANNING



NOTES:



Location Plan - 1:5000

| Rev | Date | Description | Initials |
|---|---|---|---|

Quantum Group

Quantum House, 170 Charminster Road, Charminster, Bournemouth, BH8 9RL
Email: info@quantumhomes.co.uk | Web: www.quantumhomes.co.uk
Tel: 01202 531635 | Fax: 01202 531650

Project:

Former Imperial College Private Ground , Udney Park Road, Teddington

Drawing Title:

Plot C - Existing Car Park Proposed First Floor Plan

Discipline:

ARCHITECTURAL

Drawn by: JC

Checked by: SH

Scale: 1:100@A1

Date: July 2017

Drawing Number: 900-SK19

Revision: .

When Scaled correctly this bar measures 100mm.


0m 5m 10m 15m
1:100

# PLANNING

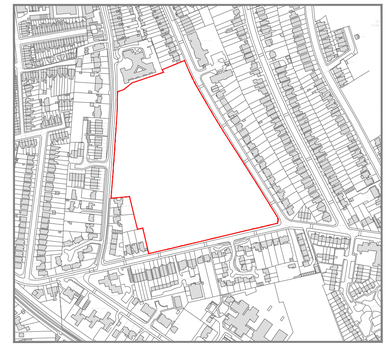


Do Not Scale, Use figure dimensions.

Check all dimensions on site before work proceeds, report discrepancies to Architect.

If In Doubt Ask!!

NOTES:



Location Plan - 1:5000

| Rev | Date | Description | Initials |
|---|---|---|---|

Quantum Group

Quantum House, 170 Charminster Road, Charminster, Bournemouth, BH8 9RL
Email: info@quantumhomes.co.uk | Web: www.quantumhomes.co.uk
Tel: 01202 531635 | Fax: 01202 531650

Project:

Former Imperial College Private Ground , Udney Park Road, Teddington

Drawing Title:

Plot C - Existing Car Park Proposed Second Floor Plan

Discipline:

ARCHITECTURAL

Drawn by: JC

Checked by: SH

Scale: 1:100@A1

Date: July 2017

Drawing Number: 900-SK20

Revision: .

# Appendix B

## ADF Simulation Inputs & Assumptions

The following common practice inputs and assumptions were made in accordance with the BS 8206-2:2008, Annex A, Tables A.1-A.6 for the calculation of the Average Daylight Factors. These are tabulated below. Glazing specifications are based on Pilkington's Glass Handbook (2010).

| **Table B1: Material Properties *(Source: British Standard 8206-2:2008)*** | |
|---|---|
| **Material** | **Surfance Reflectance** |
| Ground (earth/paving) | 20% |
| Site Context/Neighbouring Buildings (Typical Brickwork) | 30% |
| Proposed External Walls (medium coloured) | 30% |
| Proposed Balcony Soffit – assumed light coloured | 50% |
| Proposed Internal Walls (light coloured: white plaster) | 70% |
| Proposed Ceilings (light coloured) | 85% |
| Proposed Internal Floor (light coloured timber finishing) | 30% |

| **Table B2: Light Transmittance Calculation *(Source: British Standard 8206-2:2008)*** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Glazing Description** | **Position** | **Frames modelled** | **U-value (W/m2K)** | **g-value** | **LT-value** | **Maintenance Factors** | | | **Frames** | **Simulation LT-value** |
| | | | | | | **A.3** | **A.4** | **A.5** | **A.6** | |
| **Urban Area Outside Central London** | | | | | | | | | | |
| Double Solar Control Glazing | Vertical | No | 1.1 | **0.43** | **0.70** | 4 | 1 | 1 | 0.8 | **0.54** |

# Appendix C

## ADF Contours

When Scaled correctly this bar measures 100mm.


0m 10m 20m 30m
1:200

DF (%)

0.0
0.3
0.7
1.0
1.3
1.7
>= 2.0

HODKINSON

**Project Title:**
Former ICL Ground at Udney Park Road

**Client:**
Quantum Group

**Internal Daylighting Assessment**

**Drawing:**
Average Daylight Factor Contours - Level 00

| Prepared by: | Checked by: | Date: |
|---|---|---|
| EP | OT | June 2017 |

Quantum Group

Quantum House, 170 Charminster Road, Charminster, Bournemouth, BH8 9RL
Email: info@quantumhomes.co.uk | Web: www.quantumhomes.co.uk
Tel: 01202 531635 | Fax: 01202 531650

Project:
Former Imperial College Private Ground , Udney Park Road, Teddington

Drawing Title:
Plot A - Apartments Proposed Basement Floor Plan

Discipline:
ARCHITECTURAL

| Drawn by: | Checked by: |
|---|---|
| PL | SH |

| Scale: | Date: |
|---|---|
| 1:200@A1 | July 2017 |

Drawing Number: 900-SK05

Revision: .

When Scaled correctly this bar measures 100mm


0m
1:100
5m
10m
15m

DF (%)

0.0
0.3
0.7
1.0
1.3
1.7
>= 2.0

HODKINSON

**Project Title:**
Former ICL Ground at Udney Park Road

**Client:**
Quantum Group

**Internal Daylighting Assessment**

**Drawing:**
Average Daylight Factor Contours - Level 0

| Prepared by: | Checked by: | Date: |
|---|---|---|
| EP | OT | June 2017 |

Quantum Group

Quantum House, 170 Charminster Road, Charminster, Bournemouth, BH8 9RL
Email: info@quantumhomes.co.uk | Web: www.quantumhomes.co.uk
Tel: 01202 531635 | Fax: 01202 531650

Project:
Former Imperial College Private Ground , Udney Park Road, Teddington

Drawing Title:
Plot A - Apartments
Proposed Ground Floor Plan

Discipline:
ARCHITECTURAL

| Drawn by: | Checked by: |
|---|---|
| JC - PL | SH |

| Scale: | Date: |
|---|---|
| 1:200@A1 | July 2017 |

Drawing Number: 900-SK06

Revision: .

When Scaled correctly this bar measures 100mm

ROAD

N

**Plot B**
**South Ground**
**Floor Dwelling**

0m 5m 10m 15m
1:100

DF (%)
0.0
0.3
0.7
1.0
1.3
1.7
>= 2.0

HODKINSON

**Project Title:**
Former ICL Ground at Udney Park Road

**Client:**
Quantum Group

**Internal Daylighting Assessment**

**Drawing:**
Average Daylight Factor Contours - Plot B Level 0

| Prepared by: | Checked by: | Date: |
|---|---|---|
| EP | OT | June 2017 |


Quantum Group

Quantum House, 170 Charminster Road, Charminster, Bournemouth, BH8 9RL
Email: info@quantumhomes.co.uk | Web: www.quantumhomes.co.uk
Tel: 01202 531635 | Fax: 01202 531650


Project:
Former Imperial College Private Ground , Udney Park Road, Teddington

Drawing Title:
Plot B - Existing Club House Proposed Ground Floor Plan

Discipline:
ARCHITECTURAL

| Drawn by: | Checked by: |
|---|---|
| JC | SH |

| Scale: | Date: |
|---|---|
| 1:100@A1 | July 2017 |

Drawing Number: 900-SK15

Revision: .

When Scaled correctly this bar measures 100mm.


DF (%)

0.0
0.3
0.7
1.0
1.3
1.7
>= 2.0

HODKINSON

**Project Title:**
Former ICL Ground at Udney Park Road

**Client:**
Quantum Group

**Internal Daylighting Assessment**

**Drawing:**
Average Daylight Factor Contours - Level 01

| Prepared by: | Checked by: | Date: |
|---|---|---|
| EP | OT | June 2017 |

0m 10m 20m 30m
1:200

Quantum Group

Quantum House, 170 Charminster Road, Charminster, Bournemouth, BH8 9RL
Email: info@quantumhomes.co.uk | Web: www.quantumhomes.co.uk
Tel: 01202 531635 | Fax: 01202 531650

Project:
Former Imperial College Private Ground , Udney Park Road, Teddington

Drawing Title:
Plot A - Apartments
Proposed First Floor Plan

Discipline:
ARCHITECTURAL

| Drawn by: | Checked by: |
|---|---|
| JC - PL | SH |

| Scale: | Date: |
|---|---|
| 1:200@A1 | July 2017 |

Drawing Number: 900-SK07

Revision: .

When Scaled correctly this bar measures 100mm.


DF (%)

0.0
0.3
0.7
1.0
1.3
1.7
>= 2.0

HODKINSON

**Project Title:**
Former ICL Ground at Udney Park Road

**Client:**
Quantum Group

**Internal Daylighting Assessment**

**Drawing:**
Average Daylight Factor Contours - Level 02

| Prepared by: | Checked by: | Date: |
|---|---|---|
| EP | OT | June 2017 |

0m 10m 20m 30m
1:200

Quantum Group

Quantum House, 170 Charminster Road, Charminster, Bournemouth, BH8 9RL
Email: info@quantumhomes.co.uk | Web: www.quantumhomes.co.uk
Tel: 01202 531635 | Fax: 01202 531650

Project:
Former Imperial College Private Ground , Udney Park Road, Teddington

Drawing Title:
Plot A - Apartments
Proposed Second Floor Plan

Discipline:
ARCHITECTURAL

| Drawn by: | Checked by: |
|---|---|
| JC - PL | SH |

| Scale: | Date: |
|---|---|
| 1:200@A1 | July 2017 |

Drawing Number: 900-SK08

Revision: .

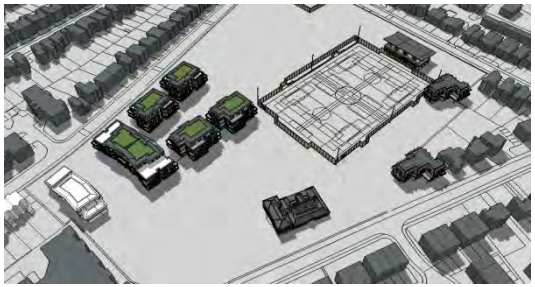
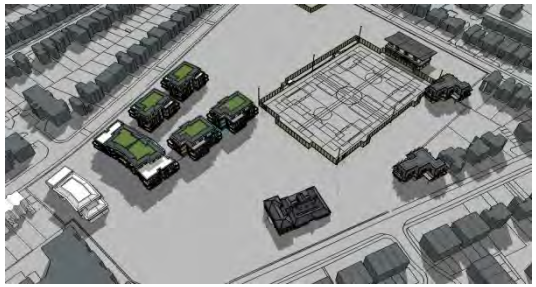
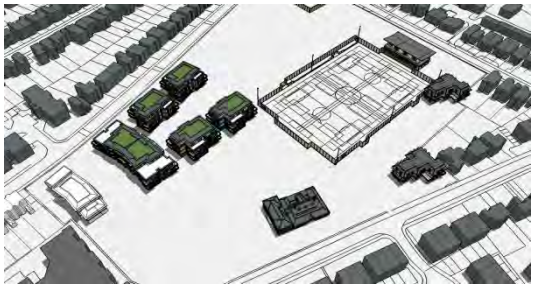
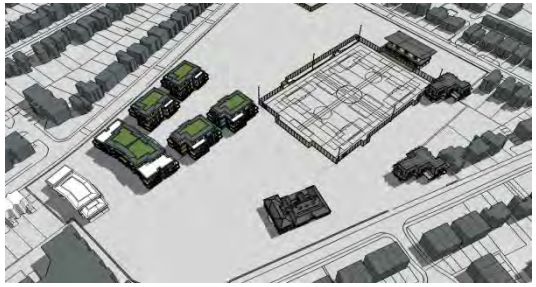
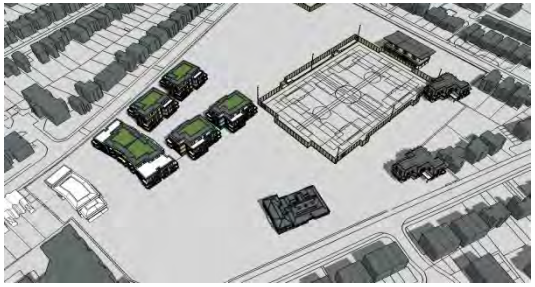
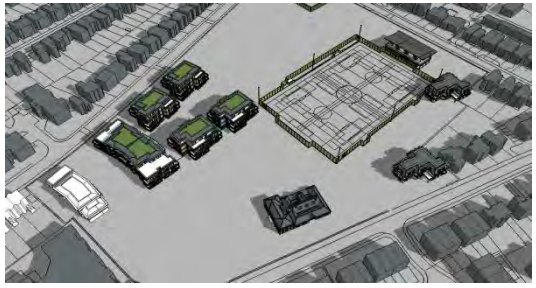
# Appendix D

## Site Survey Photography

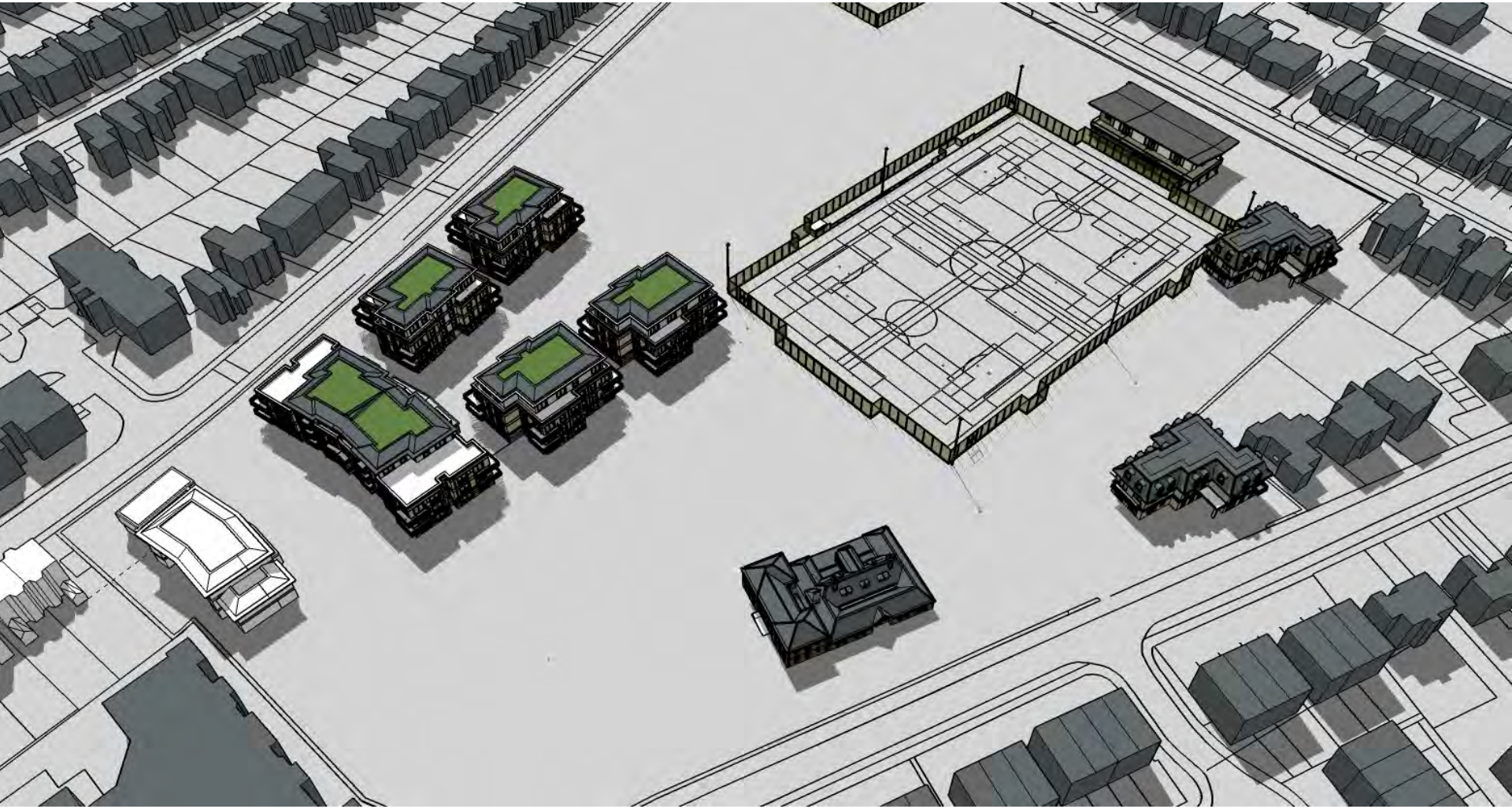

KINGSTON LANE

# Appendix E

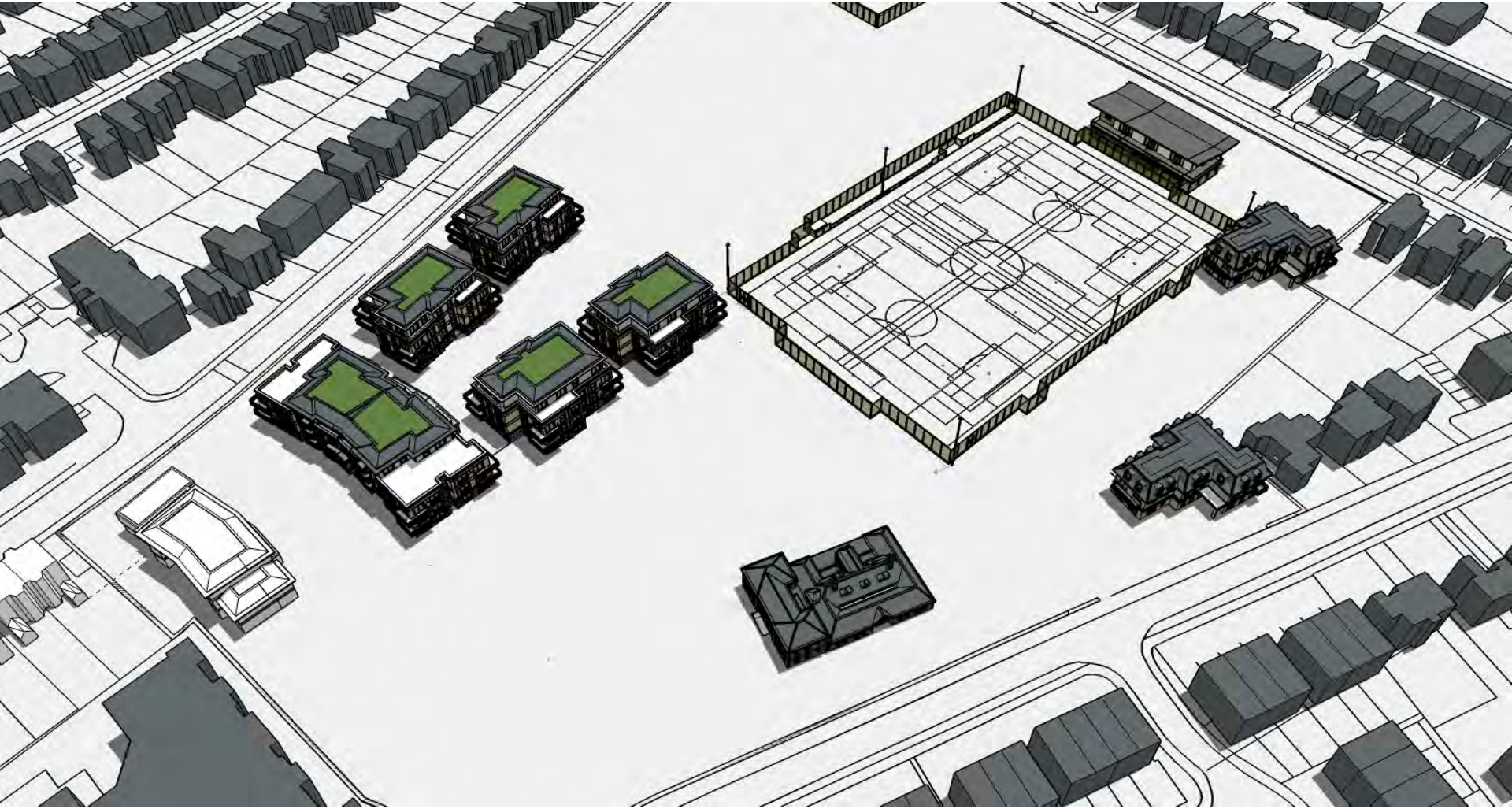
## Transient Overshadowing Diagrams

| | Summer Solstice<br>21st June | Spring / Autumn Equinox<br>21st September | Winter Solstice<br>21st December |
|---|---|---|---|
| 9.00 am |  |  |  |
| 12.00 pm |  |  |  |
| 15.00 pm |  |  |  |

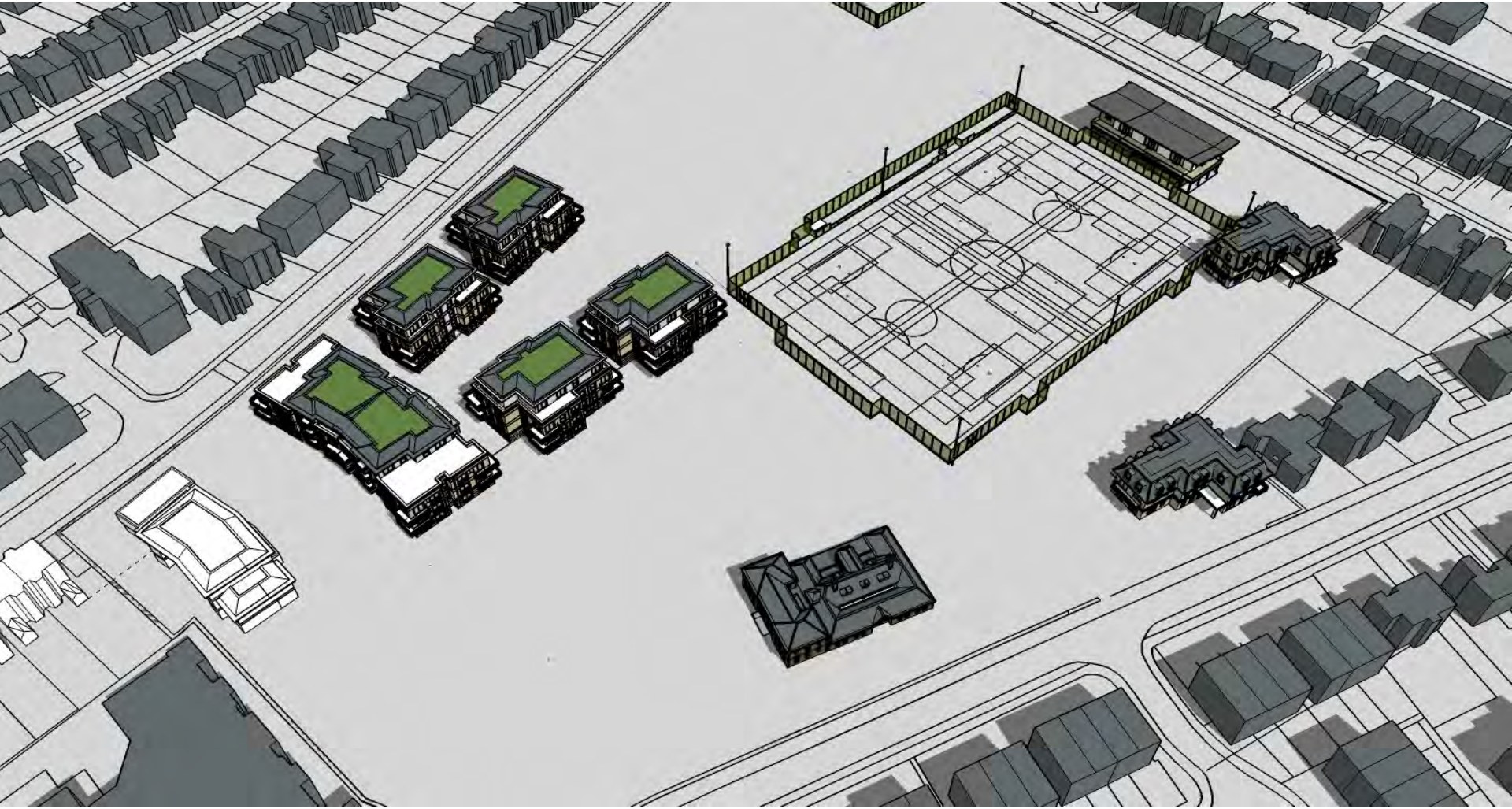
Summer Solstice
21st June, 09:00 am



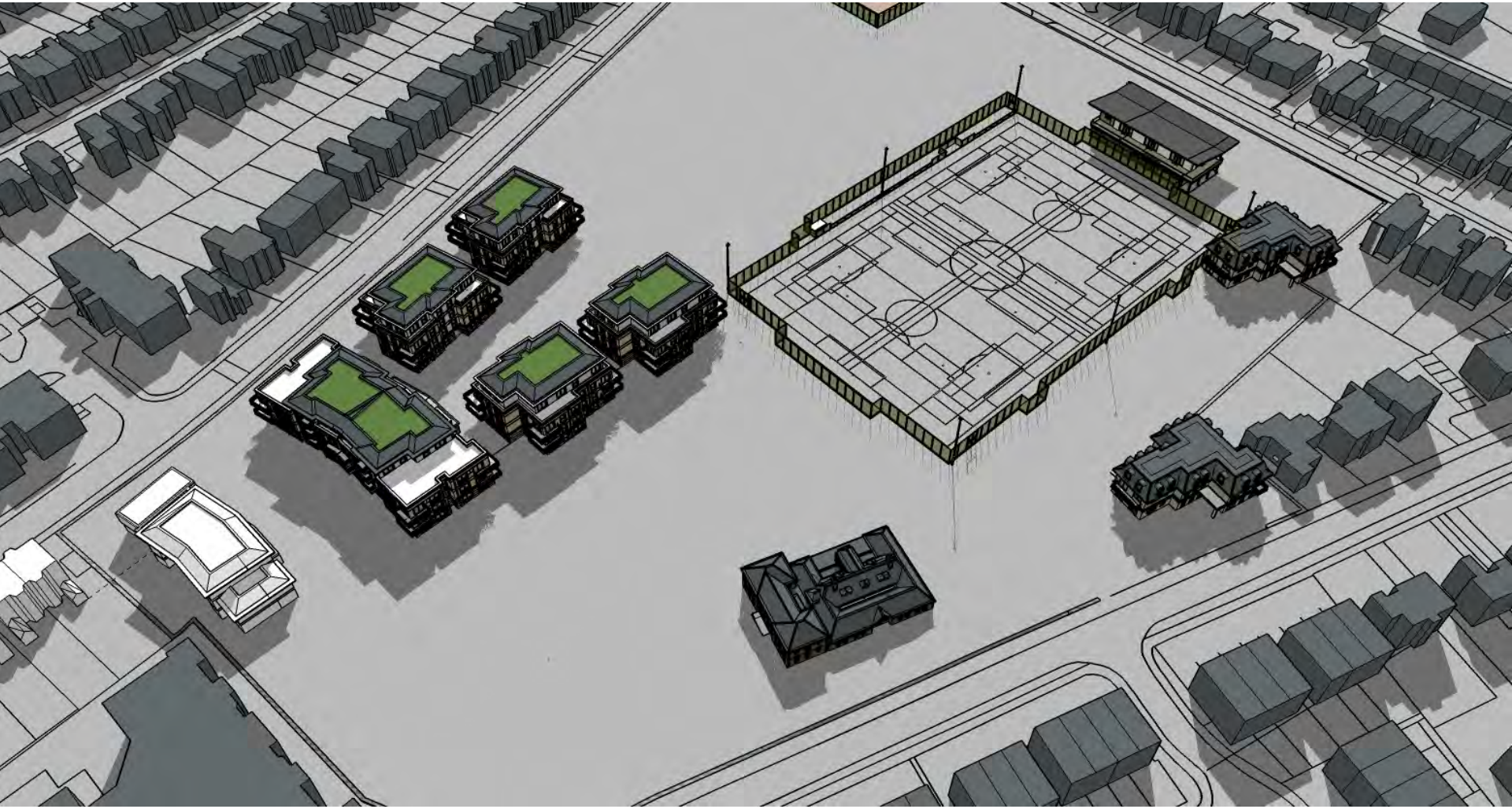
Summer Solstice
21st June, 12:00 pm



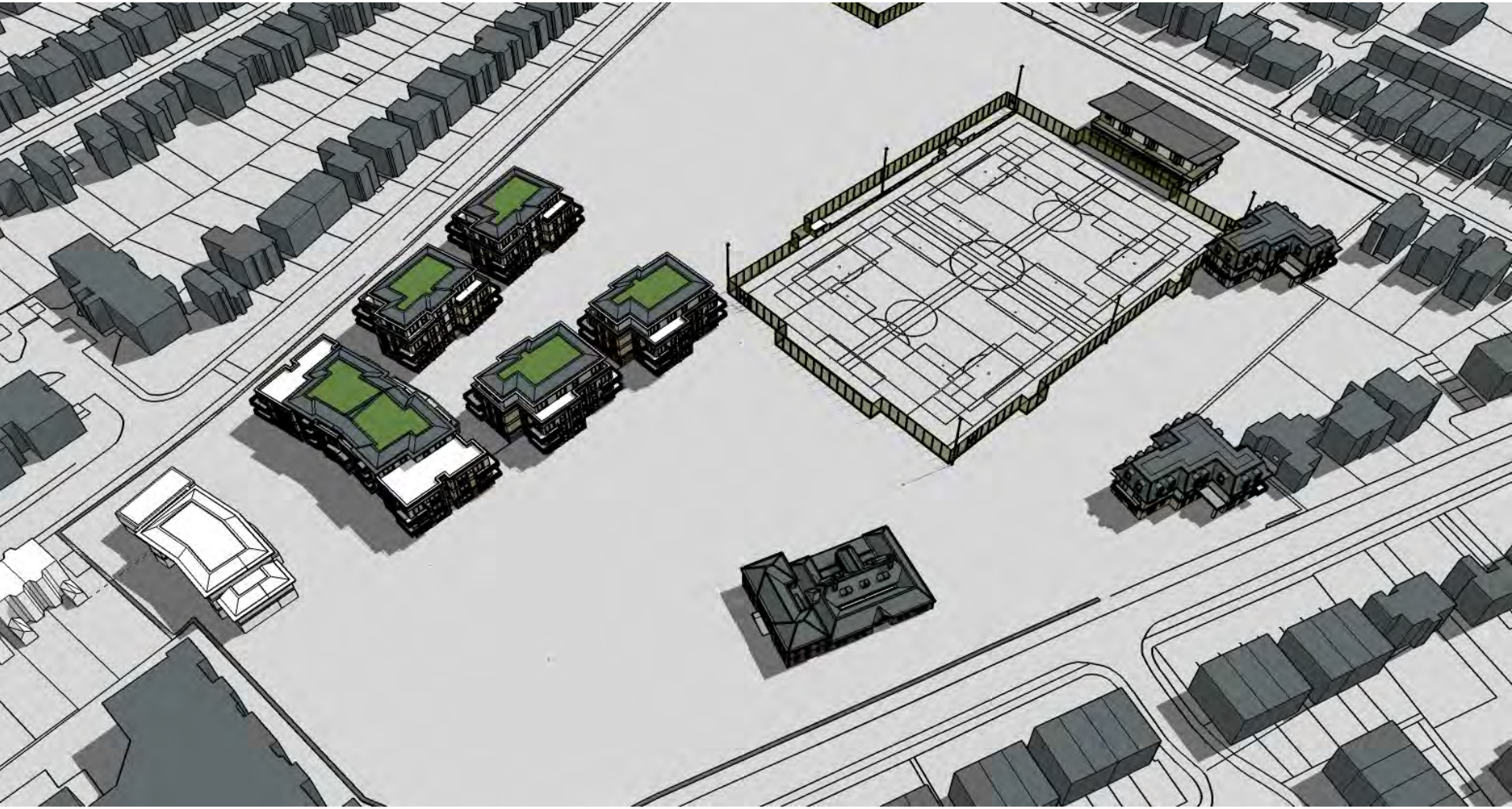
Summer Solstice
21st June, 15:00 pm



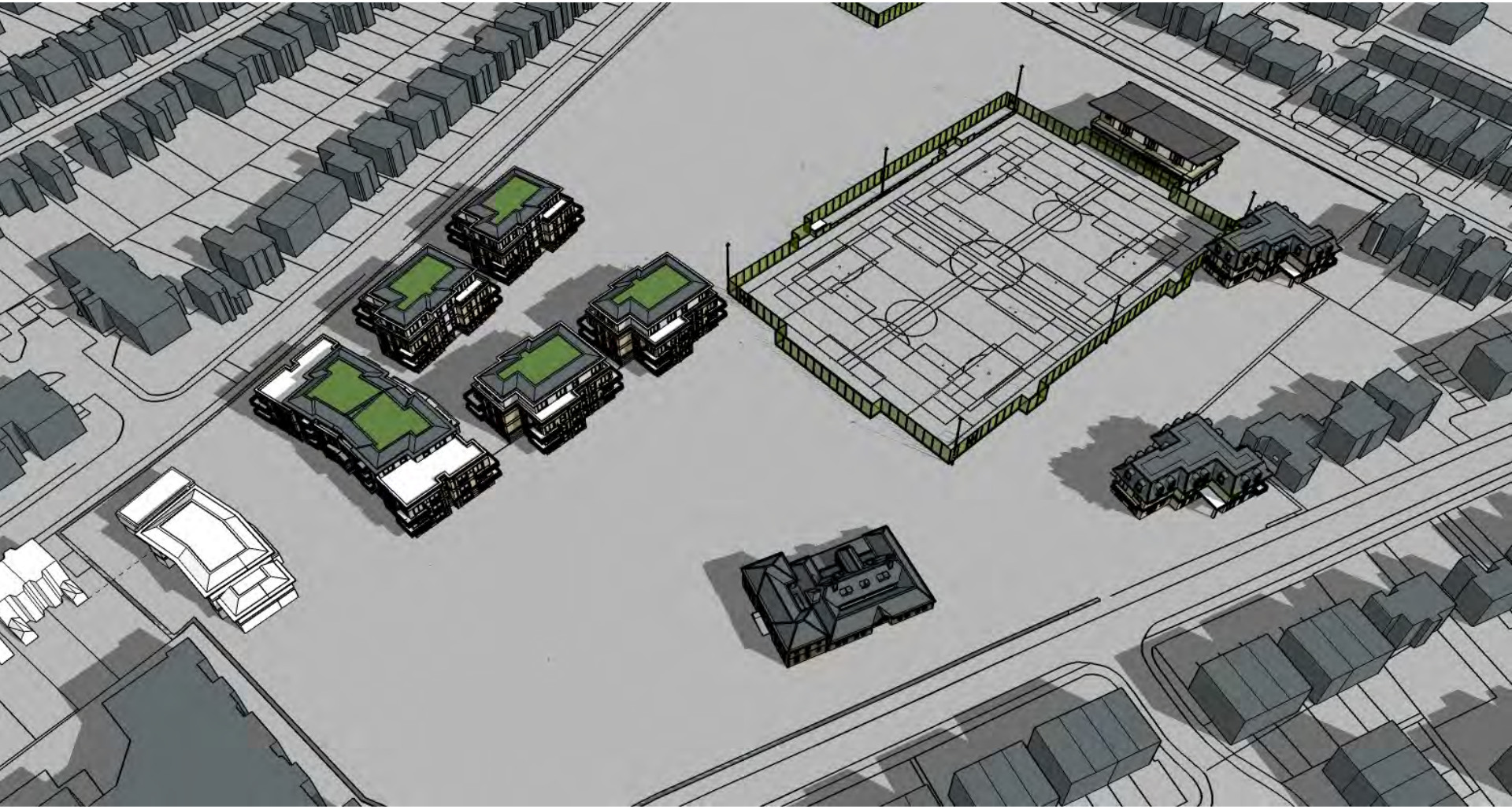
Spring/Autumn Equinoxes
21st September, 09:00 am



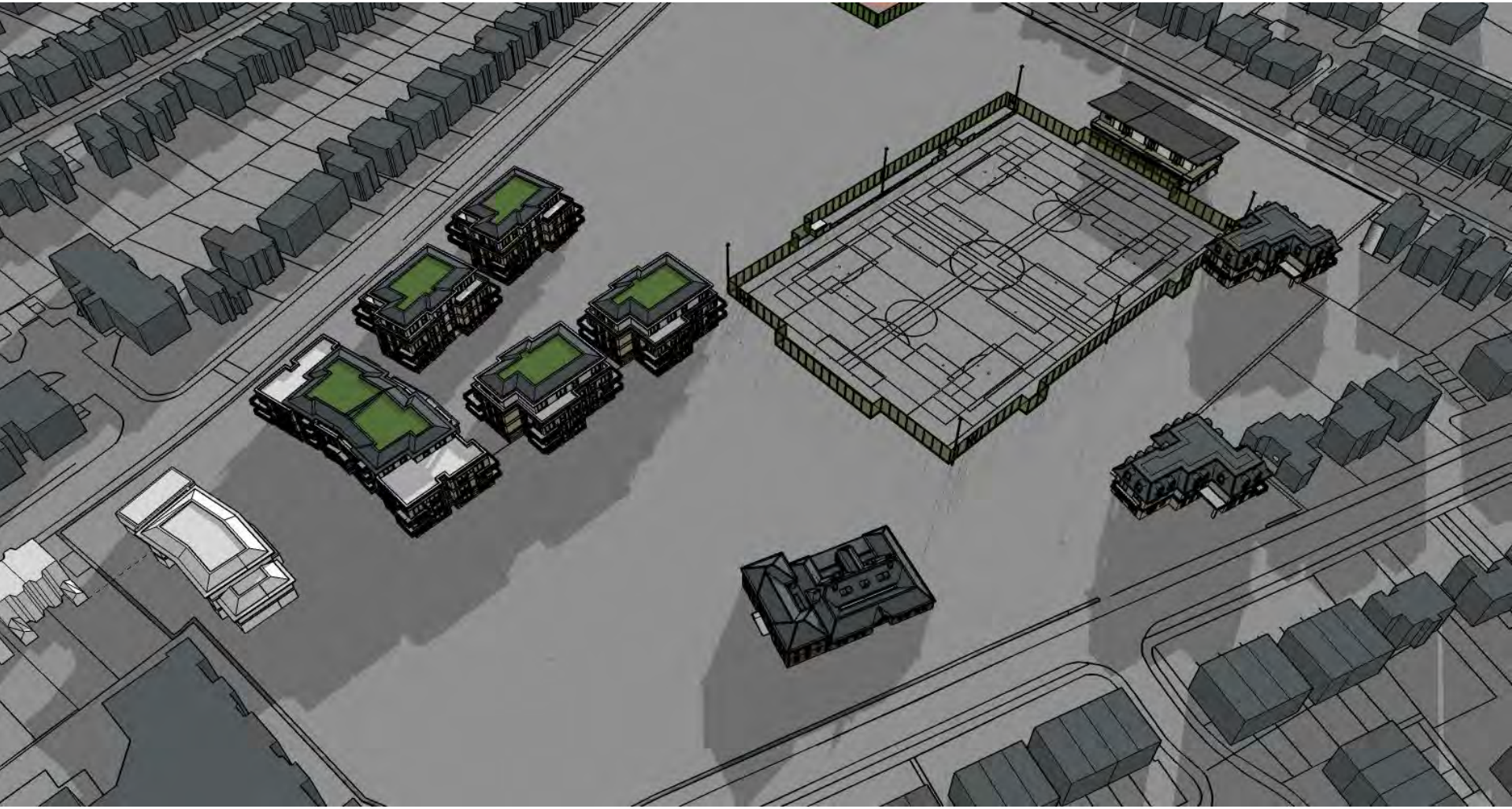
Spring/Autumn Equinoxes
21st September, 12:00 pm



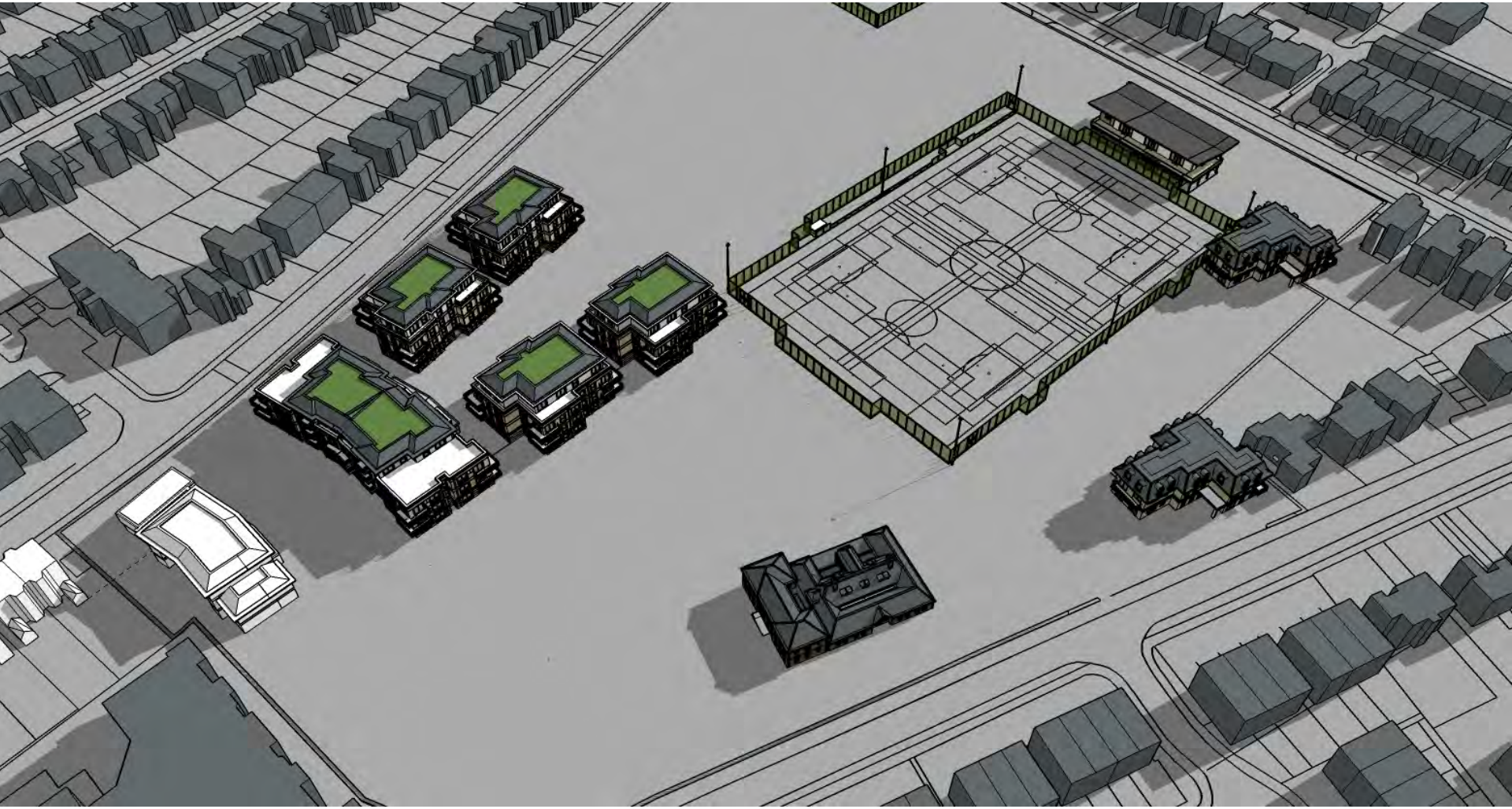
Spring/Autumn Equinoxes
21st September, 15:00 pm



Winter Solstice
21st December, 09:00 am



Winter Solstice
21st December, 12:00 pm



Winter Solstice
21st December, 15:00 pm