



**Client: Be First**

Daylight and Sunlight Scoping Assessment for the Site at Land at Kier Hardie  
Way, Barking, IG11 9NU

**September 2020**

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# Client: Be First

## Daylight and Sunlight Assessment for the Development at Land at Kier Hardie Way, Barking, IG11 9NU

### Contents Amendment Record

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## 1 Background and Scope of Appraisal

### 1.1 Study Objectives

Herrington Consulting has been commissioned by Be First to assess the potential impact of the proposed development at Land at Kier Hardie Way, Barking, IG11 9NU, in relation to daylight, sunlight and overshadowing on the neighbouring buildings. This assessment has been carried out as part of the due diligence process and precedes any initial design input. The objective is therefore to:

- assess the baseline conditions at the site;
- analyse the potential impacts of the development on the daylight and sunlight currently received by the neighbouring building(s) for a range of potential scheme massing options; and
- advise on the design envelope that will ensure that all reductions in daylight and sunlight are compliant with relevant planning policies and best practice guidance.

### 1.2 Site Location

The site is situated in the area of Upney and is located within the London Borough of Barking and Dagenham. The location of the site is shown in Figure 1.1.

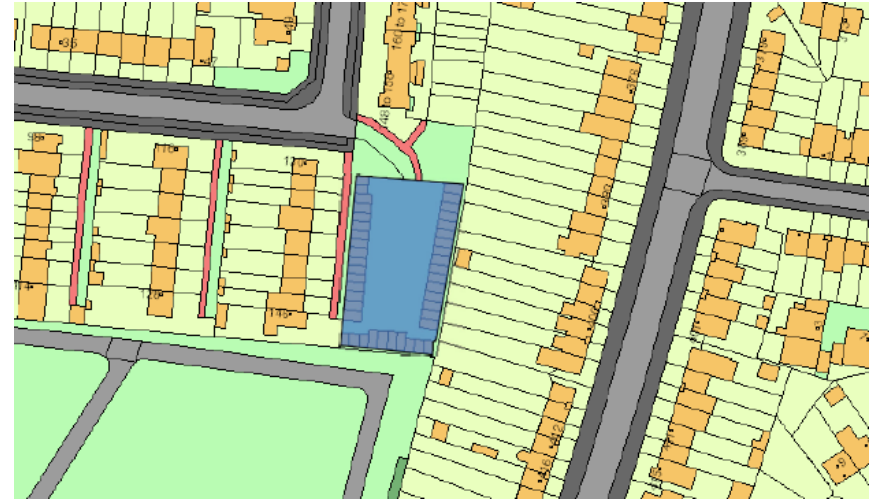


Figure 1.1 – Location map (Contains Ordnance Survey data © Crown copyright and database right 2011)

## 2 Policy and Guidance

### 2.1 National Planning Policy

#### **National Planning Policy Framework (Revised February 2019)**

Paragraph 123 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)."

#### **Guidance on Effective Use of Land (Revised July 2019)**

The guidance states that: 'Where a planning application is submitted, local planning authorities will need to consider whether the proposed development would have an unreasonable impact on the daylight and sunlight levels enjoyed by neighbouring occupiers, as well as assessing whether daylight and sunlight within the development itself will provide satisfactory living conditions for future occupants.'

Further to this, it also states that 'All developments should maintain acceptable living standards. What this means in practice, in relation to assessing appropriate levels of sunlight and daylight, will depend to some extent on the context for the development as well as its detailed design. For example in areas of high-density historic buildings, or city centre locations where tall modern buildings predominate, lower daylight and daylight and sunlight levels at some windows

may be unavoidable if new developments are to be in keeping with the general form of their surroundings.

*In such situations good design (such as giving careful consideration to a building's massing and layout of habitable rooms) will be necessary to help make the best use of the site and maintain acceptable living standards.'*

### 2.2 Regional Planning Policy

#### **The London Plan – Spatial Development Strategy for London (2016)**

Policy 7.6: 'Architecture' of the adopted London Plan, includes the following statements: "Buildings and structures should... not cause unacceptable harm to the amenity of surrounding land and buildings, particularly residential buildings, in relation to... overshadowing.". "New development, (...), should not have a negative impact on the character or amenity of neighbouring sensitive land uses".

#### **The London Plan – Supplementary Planning Guidance on Housing (2016)**

Policy 7.6Bd on 'Standards for privacy, daylight and sunlight' requires new development to avoid causing 'unacceptable harm' to the amenity of surrounding land and buildings, particularly in relation to privacy and overshadowing'. It also states that 'An appropriate degree of flexibility needs to be applied when using BRE guidelines to assess the daylight and sunlight impacts of new development on surrounding properties, (...). Guidelines should be applied sensitively to higher density development, especially in opportunity areas, town centres, large sites and accessible locations, where BRE advice suggests considering the use of alternative targets'

In the 'Standards for privacy, daylight and sunlight', Paragraph 1.3.46 states that 'The degree of harm on adjacent properties (...) should be assessed drawing on

*broadly comparable residential typologies within the area and of a similar nature across London'. Similarly, Paragraph 2.3.47 on 'Daylight and Sunlight' includes the following statement 'Quantitative standards on daylight and sunlight should not be applied rigidly, without carefully considering the location and context and standards experienced in broadly comparable housing typologies in London'.*

## 2.3 Local Planning Policy

### ***Barking and Dagenham's Draft Local Plan 2019-2034 (November 2019)***

Under Draft Policy DM11: Responding to place, it is stated that "*All development should: (...) consider the impact on the amenity of neighbouring properties with regard to significant overlooking (loss of privacy and immediate outlook) and overshadowing (unacceptable loss of daylight/sunlight), and mitigate the impact of air, noise and environmental pollution;*"

### ***Planning for the future of Barking and Dagenham – Borough Wide Development Policies Development Plan Document (March 2011)***

Policy BP8 'Protecting Residential Amenity' states that '*All developments (including alterations, extensions and infill developments) are expected to:... Not lead to significant overlooking (loss of privacy and immediate outlook) or overshadowing (loss of daylight and sunlight)*'.

## 2.4 Best Practice Guidance

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

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

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

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

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

## 3 Assessment Techniques

### 3.1 Background

Natural light refers to both daylight and sunlight. However, a distinction between these two concepts is required for the purpose of analysis and quantification of natural light in buildings. In this assessment, the term '*Daylight*' is used for natural light where the source is the sky in overcast conditions, whilst '*Sunlight*' refers specifically to the light coming directly from the sun.

The primary objective of this assessment is to assess the site constraints in terms of the potential impacts a new development may have on the adjacent buildings and to make recommendations as to a design envelope that can be applied at the site to ensure that adverse daylight and sunlight impacts are minimised. This is carried out using the methodologies set out by the BRE Guidelines.

The BRE guidelines are primarily intended for use for residential rooms in adjoining dwellings. However, they may also be applied to any existing non-domestic buildings where the occupants have a reasonable expectation of daylight, which could include schools, hospitals, hotels and offices in specific circumstances. For dwellings, it states that living rooms, dining rooms and kitchens should be assessed. Bedrooms should also be checked, although it states that they are less important. Other rooms, such as bathrooms, toilets, storerooms, circulation areas and garages need not be assessed.

As part of this scoping assessment, the following BRE tests have been applied in the derivation of the design envelope.

### 3.2 Vertical Sky Component (VSC)

The Vertical Sky Component (VSC) calculation is the ratio of the direct sky illuminance falling on the outside of a window, to the simultaneous horizontal illuminance under an unobstructed sky. The standard CIE (Commission Internationale d'Éclairage) Overcast Sky is used and the ratio is expressed as a percentage. For example, a window that has an unobstructed view over open fields would benefit from the maximum VSC, which would be close to 40%. For a window to be considered as having a reasonable amount of skylight reaching it, the BRE Guidelines suggests that a minimum VSC value of 27% should be achieved. When assessing the impact of a new development on an existing building the BRE Guidelines sets out the following specific requirement:

If the VSC with the new development in place is both less than 27% and less than 0.8 times its former value, then the reduction in light to the window is likely to be noticeable.

This means that a reduction in the VSC value of up to 20% its former value would be acceptable and thus the impact would be considered negligible. It is important to note that the VSC is a simple geometrical calculation, which provides an early indication of the potential for daylight entering the space. It does not, however, assess or quantify the actual daylight levels inside the rooms.

### 3.3 No Sky Line

The No Sky Line, or sometimes referred to as No Sky View method, describes the distribution of daylight within rooms by calculating the area of the 'working plane', which can receive a direct view of the sky. The working plane height is generally set at 850mm above floor level within a residential property and 700mm within a commercial property. When assessing the potential impacts on the daylight available to the neighbouring properties, the BRE Guidelines state that if the area within a room receiving direct skylight is reduced by less than 0.8 following the construction of a new development, the impact will be noticeable to the occupants. This is also true if the No Sky Line encroaches onto key areas like kitchen sinks and worktops.

One benefit of this test is that the resulting contour plans show where the light falls within a room and a judgment can be made as to whether the room will retain light to a reasonable depth. However, this method can only be accurately used to examine the daylight distribution within the rooms where the layout and dimensions are known. Notwithstanding this, it is accepted practice to estimate room layouts based on the property type and its overall configuration when detailed information is not available.

### 3.4 Average Daylight Factor

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

This method of quantifying the availability of daylight within a room does, however, require the internal layout to be known and is generally only used for establishing daylight provision in new rooms. The ADF test is not used at this scoping stage.

### 3.5 Annual Probable Sunlight Hours

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

To pass this test the centre point of the window will need to receive more than one quarter (25%) of the APSH, including at least 5% APSH in the winter months between 21<sup>st</sup> September and the 21<sup>st</sup> March. The BRE Guidelines state that if 'post-development' the available sunlight hours are both less than the amount above and less than 0.8 times their 'pre-development' value, either over the whole year or just within the winter months, then the occupants of the existing building will notice the loss of sunlight. In addition, if the overall annual loss is greater than 4% of APSH, the room may appear colder and less pleasant.

### 3.6 Overshadowing

The BRE Guidance suggests that where new development may affect one or more amenity areas, then analysis can be undertaken to quantify the loss of sunlight resulting from overshadowing. 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. Amenity areas in the form of balconies



are not recommended to be assessed under the BRE Guidelines due to their small size and often significant obstruction.

The BRE Guidelines recommend that for a garden or amenity area to appear adequately sunlit throughout the year, at least 50% of an amenity area should receive at least 2 hours of sunlight on 21<sup>st</sup> March. The BRE Guidelines also suggest that if, as a result of a new development, an existing garden or amenity area does not meet these guidelines, and the area which can receive some sun on the 21<sup>st</sup> March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable.

When undertaking this analysis, sunlight from an altitude of 10° or less has been ignored as this is likely to be obscured by planting and undulations in the surrounding topography. Driveways and hard standing for cars is also usually left out of the area used for this calculation. Fences or walls less than 1.5 metres high are also ignored. Front gardens which are relatively small and visible from public footpaths are omitted with only main back gardens needing to be analysed.

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.

## 4 Assessment Methodology

### 4.1 Method of Baseline Data Collation

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

- OS Mastermap mapping
- 3D Building and terrain model constructed using photogrammetric techniques
- Aerial photography (Google Maps and Bing)

### 4.2 Identification of Key Sensitive Receptors

The BRE Guidelines are intended for use for rooms and adjoining dwellings where daylight is required, including living rooms, kitchens and bedrooms. Windows to bathrooms, toilets, storerooms circulation areas and garages are not deemed as requiring daylight and therefore are not identified as sensitive receptors. The BRE document also states that the guidelines may also be applied to any non-domestic building where the occupants have a reasonable expectation of daylight. This would normally include schools, hospitals, hotels, hostels, small workshops and some offices.

The first step in this process is to determine the key sensitive receptors, i.e. which windows may be affected by the proposed development. Key receptors are those windows that face, or are located broadly perpendicular to the proposed development.

If a window falls into this category, the second step is to measure the obstruction angle. This is the angle at the level of the centre of the lowest window between the horizontal plane and the line joining the highest point of nearest obstruction formed from any part of the proposed development. If this angle is less than 25° then it is unlikely to have a substantial effect on the diffuse daylight enjoyed by the existing window and the window is not deemed to be a sensitive receptor. A graphical representation of the 25° rule is illustrated in Figure 4.1 below.

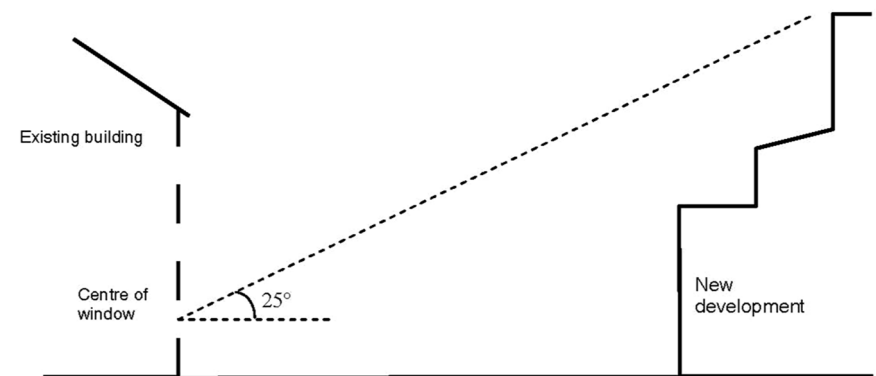


Figure 4.1 – Graphical representation of the 25° Rule (indicative buildings used for illustration purposes only)

As part of this assessment a digital three-dimensional model of the study area has been created for the current baseline scenario and this has been used to test a range of massing options so that the maximum design envelope can be optimised.

Windows serving non-habitable spaces are not included within the assessment as these are not identified by planning policy or by the BRE Guidelines to be sensitive to changes in daylight and sunlight.

Therefore, as part of the identification of sensitive receptor process, the use of each room is, where possible, established and windows serving non-habitable spaces such as toilets, storerooms, stairwells and circulation spaces are identified. Typically kitchens that have a floor area less than 13m<sup>2</sup> are not considered to be habitable spaces in their own right.

Windows serving rooms within commercial premises are assumed to be non-habitable and in accordance with the BRE Guidelines are not identified as sensitive receptors. However, there are special cases where it can be assumed that some non-domestic uses could be deemed to have a reasonable expectation of daylight and therefore could be taken forward for more detailed analysis. Typically, these could be school classrooms, hospital wards, art studios etc, but professional judgement is generally relied upon to determine this and where considered appropriate, windows serving commercial premises are included.

Drawings showing the location of all sensitive receptors that have been assessed as part of this study are included in the appendix to this report.

#### 4.3 Numerical Modelling

The numerical analysis used in this assessment has been undertaken using the Waldrum Tools (Version 5.0.0.2) software package.

#### 4.4 Calculation Assumptions

The following assumptions have been made when undertaking the analysis:

- When assessing the VSC the calculation is based on the centre point of the window position.
- Where information on internal room layouts of adjacent properties is not known, best estimates as to room layout and size have been made in order to undertake No Skyline analysis.
- Where the internal arrangements and room uses have been estimated, it should be noted that this has no bearing upon the tests for VSC or APSH because the reference point is at the centre of the window being tested and windows have been accurately drawn from the survey information where possible. It is relevant to the daylight distribution assessment, but in the absence of suitable plans, estimation is a conventional approach.
- In areas where survey data has not been provided or needs to be supplemented with additional information, photographs, OS mapping 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 existing buildings, the shading effect of the existing 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.

#### 4.5 Caveats

The analysis that has been carried out to inform this assessment has not been based on any topographic survey information as this is not available at this stage in the project development. The surrounding buildings and the terrain have, however, been derived from a 3D photogrammetry model which has a quoted accuracy of 15cm. This is perfectly adequate for this scoping stage, however, all building heights will need to be confirmed with a detailed topographic survey when the project moves to the detailed planning application stage.

The backland nature of the site also means that there is not open access to all of the potentially affected neighbouring buildings, in particular their rear elevations. The 3D model has therefore been checked and ratified with the best data that is currently available, which is the aerial imagery available from Google and Bing. This typically provides a very representative view of the surrounding area and buildings, but is only accurate up to the data on which the photographs were taken. It is therefore important when the project moves to the detailed planning application phase to ground truth the model with site inspections.

## 5 Derivation of Design Envelope

### 5.1 Objective

The objective of this exercise is to derive an envelope that represents the maximum massing that can be achieved on the site without adversely impacting the daylight and sunlight enjoyed by the neighbouring buildings.

This has been achieved by testing and refining a range of massing configurations for the site. Each one is tested against the BRE criteria for daylight, sunlight and overshadowing to amenity areas. The massing described in this section meets the assessment criteria for each of the tests described in Section 4 of this report and therefore provides an indication of the maximum scheme massing that can be achieved on the site before incurring transgressions.

### 5.2 The Design Envelope

Images of the design envelope are shown in the figures below, however, further details are provided in appendix to this report.

Whilst at this stage a topographic survey of the site has not been undertaken, the surrounding buildings and the terrain have been derived from a 3D photogrammetry model. This has a quoted accuracy of 15cm and is georeferenced and set to Ordnance Survey datum. The vertical elevation is shown on the massing envelopes as a level referenced to Ordnance Survey (mOADN) and a reference ground level is also provided so that the height of the massing relative to the ground can be ascertained.



Figure 5.1 – Image showing the Design Envelope (Plan View)

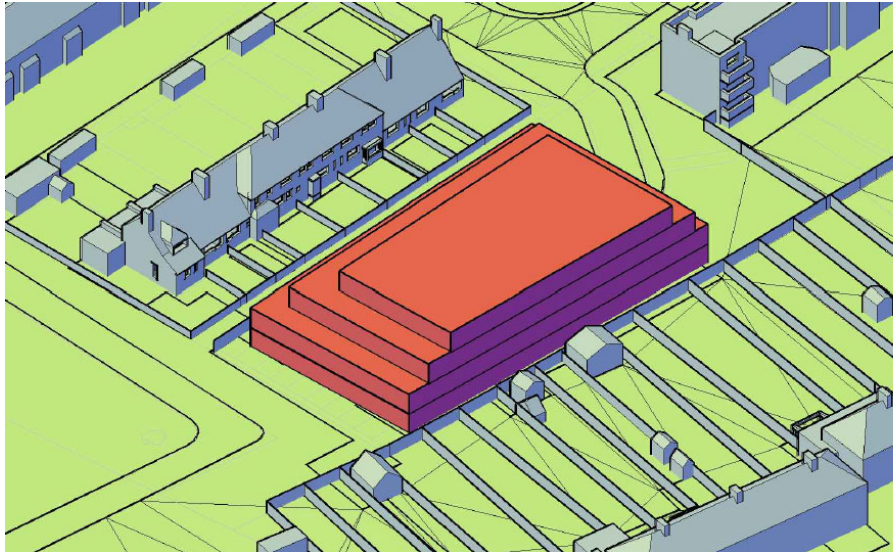


Figure 5.2 - Image showing the Design Envelope (View Looking North West)

would break up the massing. If the massing were to be sub-divided to allow space between say two or three separate blocks, then it is possible that the height of each block could be increased by an additional storey.

From the above images it can be seen that the massing has been developed based on the philosophy of developing no higher than 4 stories. Each story is assumed to be 2.8m floor to floor.

The site is constrained mainly by the properties along Kier Hardie Way as there is a small distance between the site boundary and the receptor windows, only divided by a pathway and small front garden. Therefore, the massing envelope has been stepped back at third and fourth floor level away from these receptors.

This represents a worst-case massing and if this were to be modelled as a more typical housing scheme there would be the need for amenity/garden areas, which

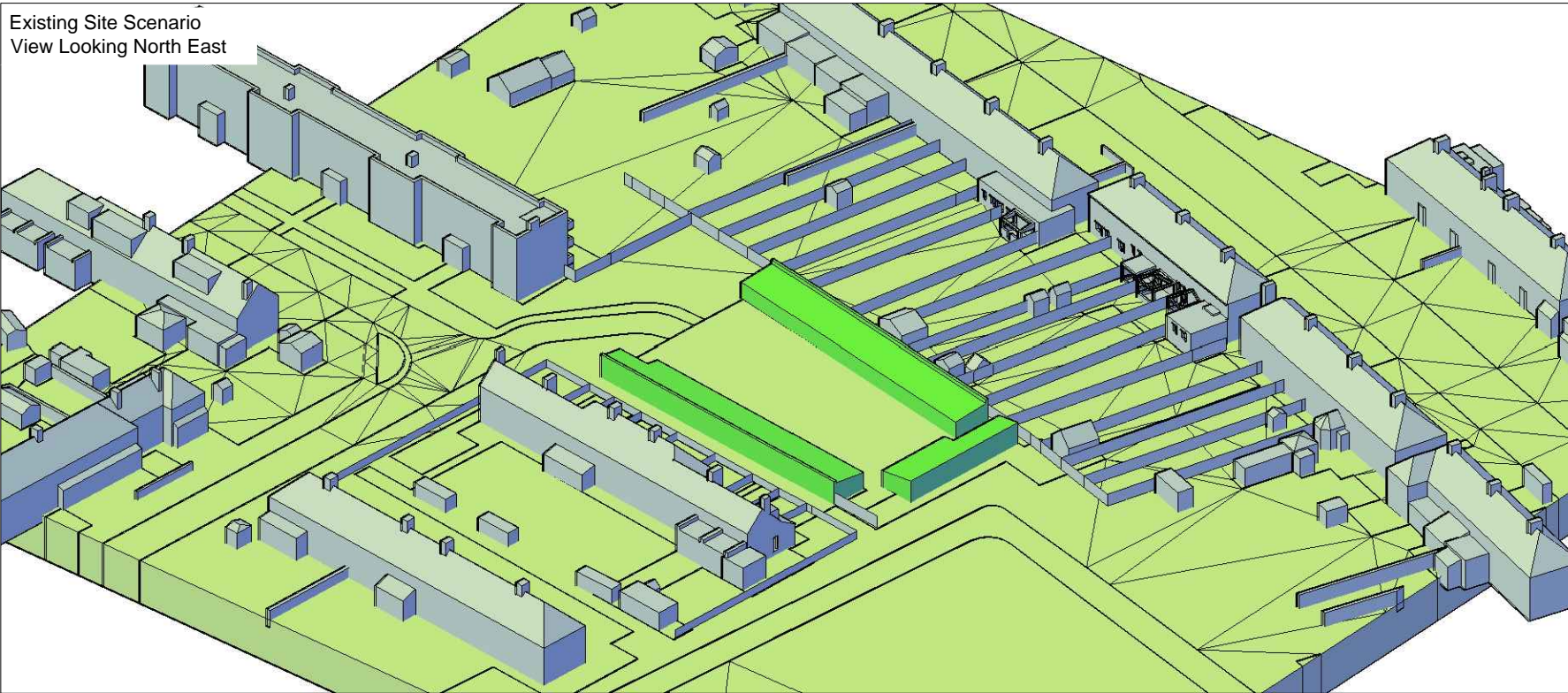
## A Appendices

### Appendix A.1 –Design Envelope Drawings

## Appendix A.1 – Design Envelope Drawings



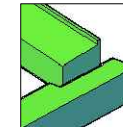
Existing Site Scenario  
View Looking North East



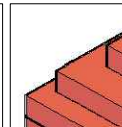
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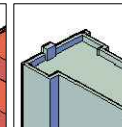
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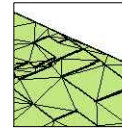
Existing Buildings



Proposed Buildings

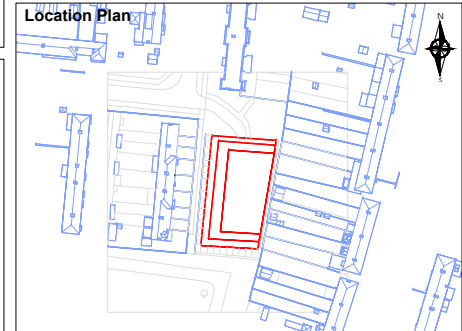


Surrounding Buildings

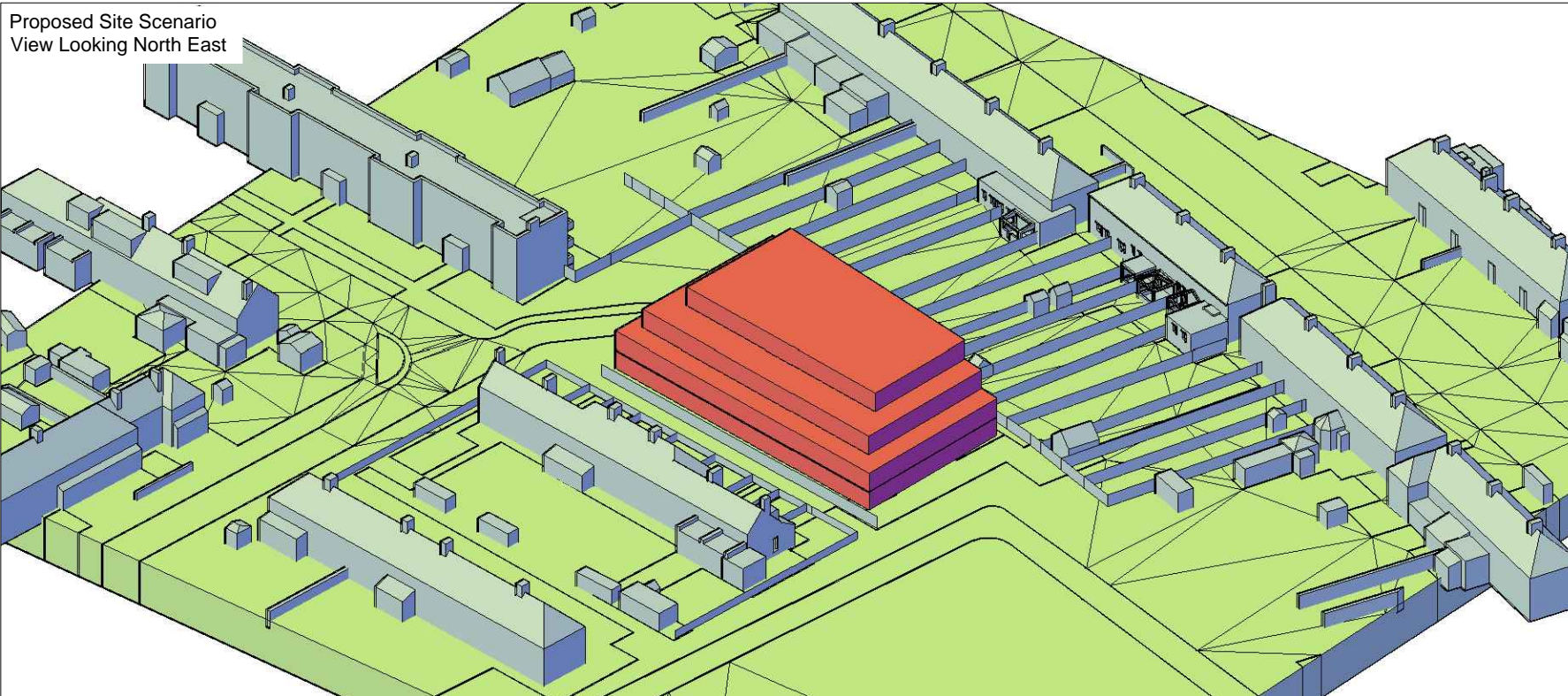


Terrain

## Location Plan



Proposed Site Scenario  
View Looking North East



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Kier Hardie Way

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3D Model - Existing & Proposed Site Scenarios.

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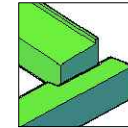
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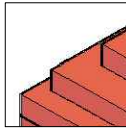
Existing Site Scenario  
View Looking South West



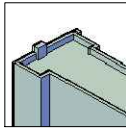
**Legend**



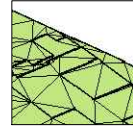
Existing Buildings



Proposed Buildings

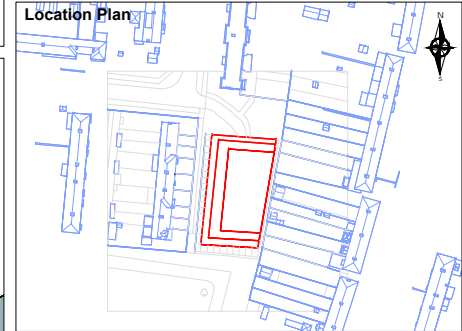


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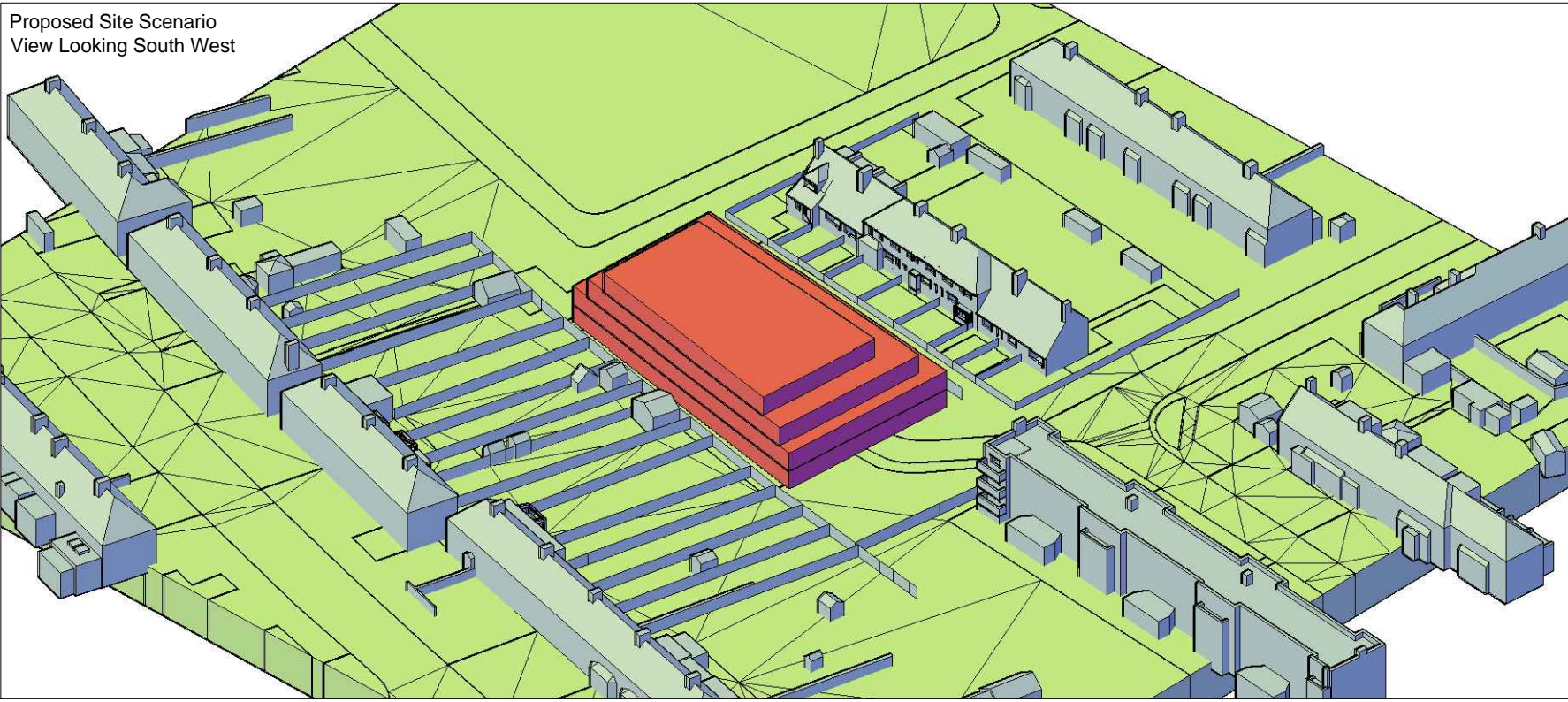


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**Location Plan**



Proposed Site Scenario  
View Looking South West



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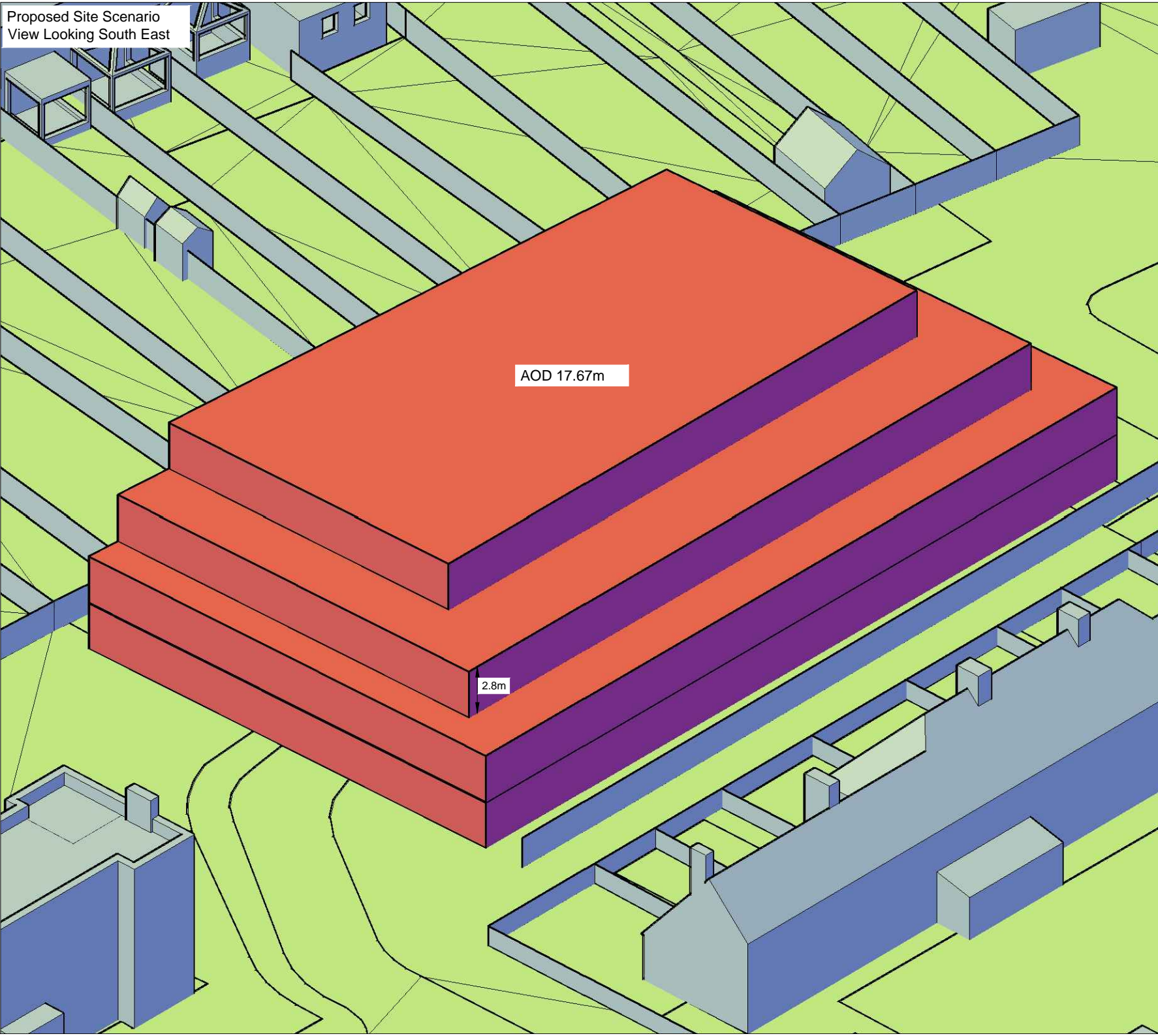
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3D Model - Existing & Proposed Site Scenarios.

DWG No.

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Proposed Site Scenario  
View Looking South East

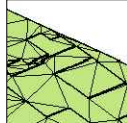
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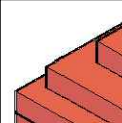
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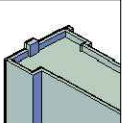
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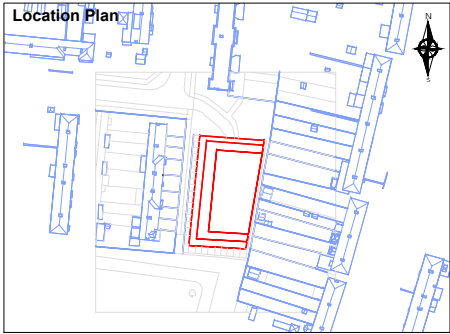


Proposed Buildings



Surrounding Buildings

### Location Plan



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Kier Hardie Way

SCALE

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3D Model - Proposed Site Scenario.

DWG No.

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Proposed Site Scenario  
View Looking East



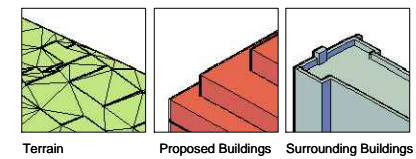
390 to 408 Lodge Avenue

Proposed Site Scenario  
View Looking West

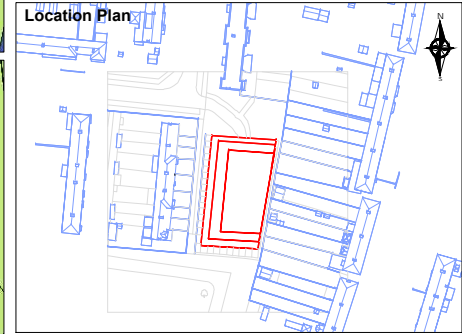


130 to 146 Kier Hardie Way

**Legend**



**Location Plan**



00	First issue	30/09/2020
Rev	Description	Date

CLIENT  
Be First

PROJECT  
Kier Hardie Way

SCALE	PROJ REF	ANALYST	DRAWN BY
Not to scale	2864	AM	AM

DWG REF. Identification of Neighbouring Properties.	DWG No. 2864_04
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