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Daylight and Sunlight

**Shorts Gardens**


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**Document References:**

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*Appended to this report:*

## 1.0 Executive Summary

GIA have undertaken a daylight and sunlight assessment to understand the impact of the proposed development at 60-72 Shorts Gardens and 14-16 Betterton Street upon neighbouring residential properties.

In total 11 properties have been assessed for daylight and sunlight, of which 10 will achieve BRE compliance in relation to VSC, NSL and APSH.

Of the 89 windows assessed, 63 (70%) will meet the BRE Guidelines for VSC and 49 (90%) of the 54 rooms assessed will achieve BRE compliance in relation to NSL. With regards to sunlight, all (100%) rooms assessed will comply with the BRE Guidelines for APSH.

There is one property (18-20 Betterton Street) adjacent to the site which experiences changes in VSC and NSL which are below the suggested BRE Guidelines.

GIA have obtained a floor plan of the fourth floor and internal photographs of 18-20 Betterton Street. On the basis of the information obtained, we have made informed assumptions as to the room uses facing the site and we believe that the principle living spaces are located to the front of the property overlooking Betterton Street. The windows facing the site are likely to serve less sensitive bedrooms and small galley style kitchens.

In consideration of the above, the main living spaces will not be affected by the redevelopment of the site. The impact to the rooms facing the site will be in breach of the BRE Guidelines, however, due to the constrained nature of the site and its proximity to the development any reasonable additional massing will cause alterations in daylight at 18-20 Betterton Street.

Given the urban location, the BRE Guidelines should be interpreted flexibly as the daylight and sunlight handbook is based on a suburban location. Furthermore, the site is located in Covent Garden were residents benefit from many other types of amenity including; access to efficient transport facilities, theatres, restaurants, bars and shops.

In conclusion, the majority of properties (90%) will adhere to the BRE Guidelines. As such, the architects have where possible tried to mitigate the reductions in daylight and sunlight to neighbouring habitable spaces.

## 2.0 Instructions

This daylight and sunlight report has been commissioned by the applicant Span Group to support their planning application for 60-72 Shorts Gardens and 14-16 Betterton Street (the 'proposed development').

The results and advice contained in this report are based upon the proposed scheme produced by Stanton Williams which was issued to GIA on the 16th March 2017.

For the purposes of this report, GIA have considered the effects that the proposed development may have upon neighbouring residential properties and their daylight and sunlight amenity.

This report considers residential properties only as they are recognised by the Building Research Establishment (BRE 2011) as having a greater requirement for daylight and sunlight than commercial properties (*Site Layout Planning for Daylight and Sunlight, A guide to good practice - Page 7, Section 2.2.2*).

## 3.0 Introduction

*Daylight and Sunlight*

The technical analysis that forms the basis of this report has been predicated against the methodologies set out within the Building Research Establishment Guidelines entitled 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice (2011)'. The guidelines in question are precisely that; guidelines which provide a recommendation to inform site layout and design. They are not mandatory nor do they form planning policy and their interpretation may be treated flexibly depending on the specifics of each site.

The BRE Guidelines provide three methodologies for daylight assessment, namely;

1) The Vertical Sky Component (VSC)
2) The No Sky Line (NSL); and
3) The Average Daylight Factor (ADF)

We have used the VSC and NSL assessment methods to analyse the effects of the proposed scheme on the surrounding properties. ADF is not generally recommended by the BRE for assessing daylight to existing surrounding properties, however, it may be used in certain circumstances and these are explained in more detail within the BRE handbook.

In addition, we have used one methodology provided by the BRE Guidelines for sunlight assessment, denoted as Annual Probable Sunlight Hours (APSH).

Appendix 01 of this report elaborates on the mechanics of each of the above assessment criteria, explains the appropriateness of their use and the parameters of each specific recommendation.

## 4.0 Sources of Information

In compiling this report we have used the following information:

**GIA**

Site Photographs – 11th May 2016 and 25th January 2017

**Vertex Modelling**

IR09-060217-VERTEX

**Find**

OS Map – 9th May 2016

**Plowman Craven**

Measured Survey (issued to GIA by Stanton Williams)

IR08-060217-Stanton Williams-latest proposals-170203_GIA-Survey Drawing

**Stanton Williams**

Proposed drawings -

IR18-280217-Stantom Williams-Final

IR21-160317-Stanton Williams-Proposal

**Valuation Office Agency**

(https://www.gov.uk/government/organisations/valuation-office-agency) – February 2017

**London Borough of Camden**

Online planning portal – Floor plans

February 2017

## 5.0 Assumptions

a) Measured survey information provided by Plowman Craven which was issued to GIA by Stanton Williams on the 6th February 2017 has been used to create the three dimensional model of the existing building on the site. We have assumed that the survey data issued is true and accurate.

b) The surrounding buildings have been modelled using high resolution aerial photography (Vertex) and thus there is a degree of tolerance (circa 150mm-300mm). The location and size of the windows within the surrounding properties is based on site observations, photographs and brick counting.

c) Due to their location and distance from the site GIA have inserted test windows within the properties listed below. The analysis of these properties is indicative:

- 177-179 Drury Lane
- 175 Drury Lane
- 176 Drury Lane
- 1 Betterton Street
- 3 Betterton Street
- 5 Betterton Street
- Betterton House

d) GIA have sought to create the most accurate model possible based on the data available, however, a degree of tolerance should be applied to this model. Where information was not available best assumptions have been used.

e) The scope of buildings assessed has been determined as a reasonable zone which considers both the scale of the proposed scheme and the proximity of those buildings which surround and face the site. There may be properties outside of the considered scope that are affected by the scheme, however, undertaking assessments beyond this area would not be commensurate with industry practices for a scheme of this size.

f) The property uses have been estimated by reference to a Valuation Office Agency search carried out in February 2017, online resources and from external observations on a site visit in January 2017.

g) GIA have obtained full or partial floor plans for the following properties:

- 9 Betterton Street
- 18-20 Betterton Street
- 24 Betterton Street
- Betterton House

These floor plans have been incorporated into our computer model. It is reasonable to assume that these layouts have been implemented, however, GIA would require access to confirm this.

h) Where we have not been able to source detailed internal floor plans we have made reasonable assumptions as to the internal layouts of the rooms behind the fenestration. This is normal practice where access to adjoining properties is undesirable in terms of development confidentiality. Unless the building form dictates otherwise, we assume a standard 4.2m deep room (14ft) for residential properties. If the internal configurations are different from our assumptions, this will not affect the VSC assessment which is calculated at the window face.

i) Floor levels have been assumed for adjoining properties as access has not been obtained. This dictates the level of the working plane which is relevant for the no sky line assessment (daylight distribution).

## 6.0 The Site

The site is located in the London Borough of Camden and is bordered by Shorts Gardens to the north, Drury Lane to the east, Betterton Street to the south and Endell Street to the west.

It is surrounded by a number of residential, commercial and mixed use properties. The property uses as we understand them are illustrated on Figure 01 below.

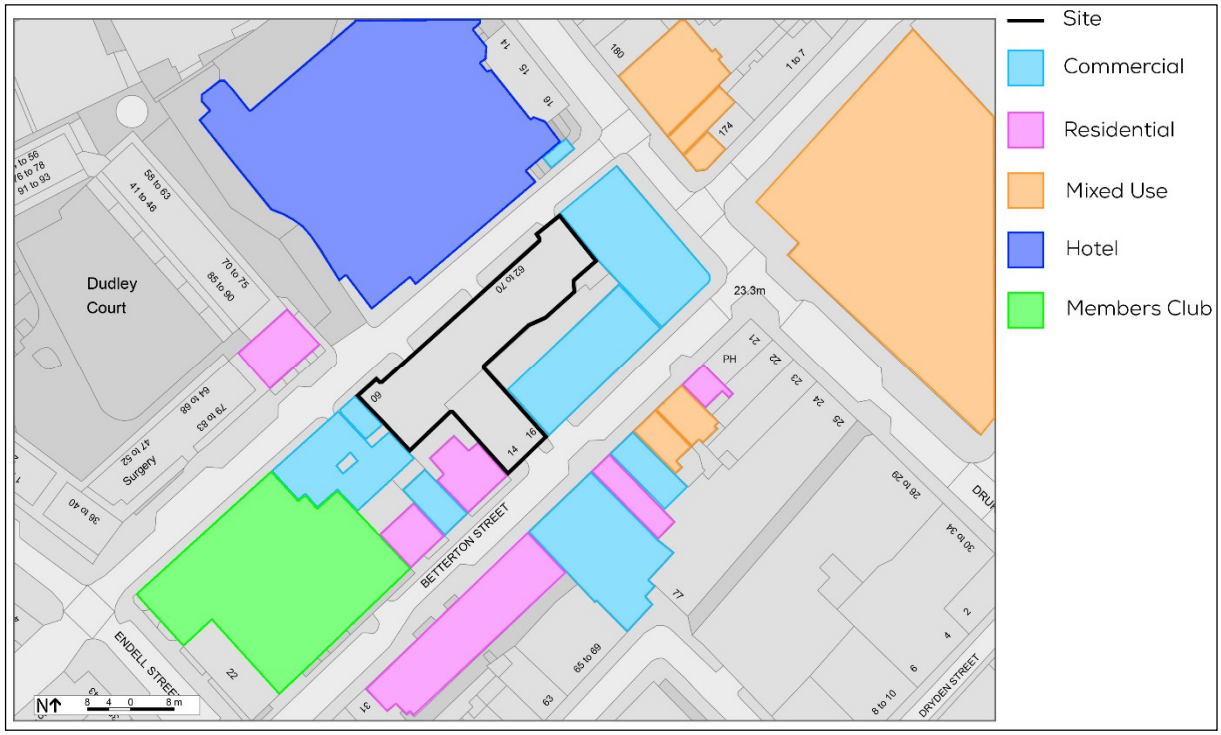



***Figure 01 – Site and surrounding properties***

The existing site and surrounding context is illustrated on Figure 02 below and on GIA drawings 3070-REL02-IS01-EX-04/05/06 which can be found in Appendix 02.


***Figure 02 – Existing building highlighted in green***

The proposal is a mixed-use development which provides an additional two storeys of commercial space at third and fourth level in Shorts Gardens. Refurbishment and reconfiguration of the existing commercial floors in Shorts Gardens will take place to accommodate commercial offices, with either A3, D1 or D2 space at ground floor. The currently unused basement will also be developed to provide A3, B1 or D1 and D2 space. Current office space on Betterton Street will also be extended by two levels and converted to residential accommodation.

The proposed development is illustrated on Figure 03 below and on GIA drawings 3070-REL02-IS01-PR-07/08/09 which are located in Appendix 02.

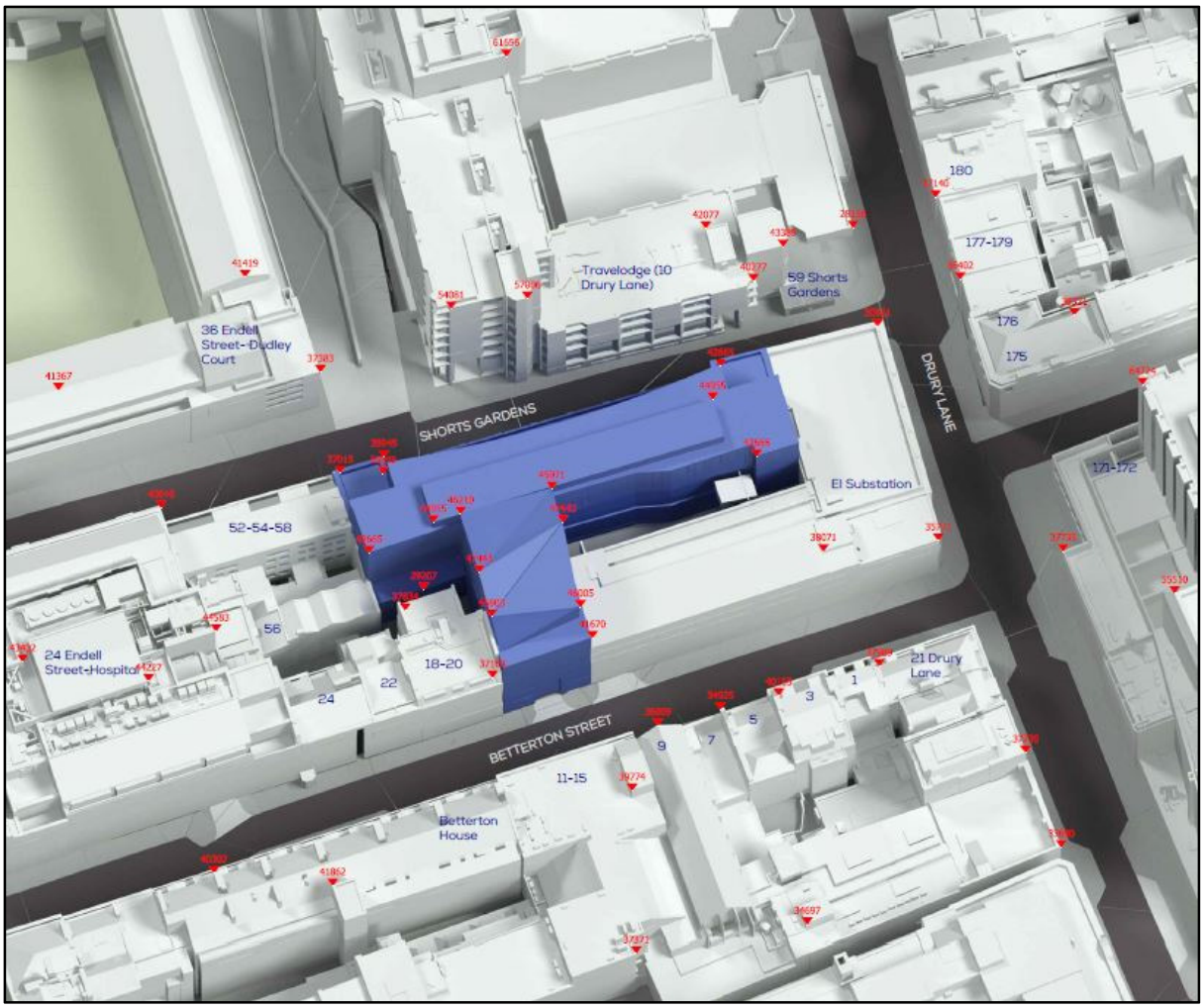



*Figure 03 – Proposed development highlighted in blue*

## 7.0 Daylight, Sunlight and Site Context

*2011 BRE Guidelines*

The BRE Guidelines are not a fixed set of rules that must be rigidly adhered to. The BRE handbook clearly states on Page 1 that the advice should be interpreted flexibly especially in city centre and urban locations. The Guidelines are intended for use across the whole of the UK, the majority of which bears little resemblance to the dense urban environments of London.

The BRE recognises that the daylight and sunlight handbook should not form a mandatory set of criteria to which a development must adhere as that would be too restrictive for site development purposes; rather it provides guidance as to what may be a noticeable alteration in the neighbour's amenity and what may be considered to be a satisfactory level of daylight and sunlight.

The guidelines themselves are predicated upon a suburban development model and the 'ideal' baseline target values they set out are based upon a suburban situation i.e. the level of light that would be expected in a situation with two storey dwellings facing one another across a reasonable width road.

The reason that this is important is that when one seeks to apply the guidelines in a more urban context, where neighbouring properties tend to be substantially taller and denser, or where the existing levels of light are low, there is a disjunction between crudely adhering to the suggested criteria and the flexibility that the guidelines themselves recommend. As a result, a degree of interpretation is necessary. Page 1 of the BRE Guidelines note that;

*'In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high rise buildings.'*

Section 2.2.3 of the BRE Guidelines further states;

*'Note that numerical values given here are purely advisory. Different criteria may be used, based on the requirements for daylighting in an area viewed against other site layout constraints.'*

Appendix F of the BRE Guidelines recommends the use of alternative target values for skylight and sunlight access when building in dense environments. Table F1 in Appendix F includes the different VSC values that can be achievable dependant on the angle of obstruction (i.e. the subtended angle from the centre of a window to the roof of a neighbouring building). It is recognised that the 27% VSC 'ideal' is rarely achieved in dense urban locations and especially London.

### *Housing Supplementary Planning Guidance (SPG)*

The Housing Supplementary Planning Guidance (SPG) issued by the Mayor of London in March 2016 includes useful commentary when assessing daylight and sunlight impacts in London. Section 1.3.45 states;

> *'An appropriate degree of flexibility needs to be applied when using the BRE Guidelines to assess the daylight and sunlight impacts of a 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.'*

On this basis, it is clear that consideration must be given to the local context and the BRE Guidelines should be interpreted flexibly in central urban locations.

## 8.0 Surrounding Properties

To understand the changes in light, a three dimensional computer model of the existing site and surrounding context has been created using measured survey information (issued to GIA on the 6th February 2017), photogrammetry (Vertex), site photographs and where possible floor plans of neighbouring properties obtained from the online planning portal and other web resources.

In accordance with the BRE Guidelines we have only considered the daylight and sunlight amenity to habitable rooms such as living rooms, kitchens and bedrooms in residential properties (BRE Guidelines, Page 7, Section 2.2.2). Non-habitable rooms such as bathrooms, WCs, store rooms and circulation spaces have been discounted from our analysis.

On the basis of our technical analysis, the properties listed below will comply with the BRE Guidelines for daylight (VSC and NSL) and sunlight (APSH).

- 24 Betterton Street
- 1 Betterton Street
- 3 Betterton Street
- 5 Betterton Street
- 9 Betterton Street
- Betterton House
- 175 Drury Lane
- 176 Drury Lane
- 177-179 Drury Lane
- 36 Endell Street, Dudley Court

There is one property which experiences changes in daylight (VSC and NSL) that are below the suggested BRE Guidelines. This property is discussed in further detail below:

*18-20 Betterton Street*

This residential property is located adjacent to the proposed development on Betterton Street.

GIA have obtained a floor plan of a fourth floor flat (Flat A) in 18-20 Betterton Street and have also sourced internal photographs of a second flat (Flat B) located on this level (see Appendix 05). Based on the floor plan, internal photographs and external observations on site we have made reasonable assumptions as to the room uses behind the windows facing the site.

It has been assumed for the purposes of our technical analysis that the flats located between the ground and third floor have the same internal configuration as those on the fourth floor. This is considered to be a reasonable approach given the similarity in the windows from our external observations. The window map in Appendix 04 illustrates our understanding of the room uses.

*Daylight (VSC and NSL)*

In total 29 windows serving 20 rooms have been assessed in relation to VSC and NSL. Following the technical analysis, it was found that three windows will meet the BRE Guidelines for VSC and five rooms will achieve BRE compliance in relation to NSL.

Of the 26 impacted windows, 13 will see an absolute change in VSC of less than 4% and five windows will experience an absolute change of between circa 4% and 5%. The existing levels of VSC to these windows is low and as such the small absolute changes in sky visibility are in instances creating a disproportionate overall percentage reduction.

The remaining eight windows will experience large alterations in VSC of between circa 50% and 71% however these rooms appear to serve bedrooms.

In relation to NSL, there are 15 rooms which will see changes in daylight distribution of between 34% and 91%. Ten of the impacted rooms are bedrooms which are less sensitive and have a lower expectation of daylight and five of the rooms are kitchens.

From the photographs and drawings obtained, we have deducted that the kitchens are likely to be galley style kitchens which due to their size are unlikely to be used for significant periods of time. The principle living and dining spaces which would be predominately used throughout the day are likely to face away from the site onto Betterton Street and will be unaffected by the proposed development.

It is important to note that due to the constrained nature of the site and its proximity to 18-20 Betterton Street any reasonable development is likely to cause alterations in daylight at this property which are below the suggested BRE Guidelines.

The site is also located in Covent Garden which is in central London. The BRE Guidelines are predicated on a suburban location and the BRE handbook clearly states that the guidance should be interpreted flexibly in urban locations. Residents in Covent Garden are unlikely to live in this area due to good levels of daylight and will benefit from other high levels of amenity including; access to efficient transport, theatres, restaurants, bars, galleries and shops.

### *Sunlight*

There are no windows in this property which face within 90 degrees of due south, as a result APSH analysis has not been undertaken.

## 9.0 Conclusions

GIA have undertaken a daylight and sunlight assessment in accordance with the BRE Guidelines as a means of assessing the alteration in light within neighbouring properties should the proposed development at 60-72 Shorts Gardens and 14-16 Betterton Street be implemented.

Following the technical analysis, it was found that of the 89 windows assessed, 63 (70%) will meet the BRE Guidelines for VSC and 49 (90%) of the 54 rooms assessed will achieve BRE compliance in relation to NSL. With regards to sunlight, all (100%) rooms assessed will comply with the BRE Guidelines for APSH.

There is one property (18-20 Betterton Street) adjacent to the proposed development which will see a change in daylight which is below the suggested BRE Guidelines.

From the floor plan (fourth floor) and internal photographs obtained, we have made informed assumptions as to the room uses facing the site and we believe that the living spaces overlook Betterton Street and the windows that face the proposal serve less sensitive bedroom spaces or small galley style kitchens.

On this basis, the principle living spaces will be unaffected by the proposed scheme. The majority of the windows and rooms facing the site will fall below the BRE Guidelines, however, due to the property's proximity to the proposed development any reasonable additional massing on the site will result in changes in daylight at 18-20 Betterton Street.

The alterations in daylight at this property should be interpreted flexibly given the urban context and the site's location in Covent Garden where residents benefit from many other types of amenity.

In summary, the majority of properties (90%) assessed will adhere to the BRE Guidelines. As such, the architects have where possible tried to mitigate the reductions in daylight and sunlight to neighbouring residential properties.

# Appendix 01

*Principles of Daylight and Sunlight*

# Principles of Daylight and Sunlight

## Background

The quality of amenity and open spaces is often stipulated within planning policy for protection or enhancement and is often a concern for adjoining properties and other interested parties.

Historically the department of environment provided guidance with the issues, and in this country, this role has now been taken on by the Building Research Establishment (BRE), the British Standards Institutions (BSI) and the Chartered Institute of Building Services Engineers (CIBSE). Fortunately they have collaborated in many areas, to provide as much unified advice as possible in the form of industry best practice.

Many local planning authorities consider daylight and sunlight an important factor for determining planning applications. Policies refer to both the protection of daylight and sunlight amenity within existing properties as well as the creation of proposed dwellings with high levels of daylight and sunlight amenities.

In terms of considering what is material, local authorities typically refer to the BRE guidelines and apply their criteria set out within. The guidelines were originally produced in 1991, but superseded by the BRE guidelines (2011*) site layout planning for daylight and sunlight.*

Where developers are seeking to maximise their development value, it is often in the area of daylight and sunlight issues that they may seek to push the boundaries. Particularly in London, there is a priority on the creation of more housing thus resulting in the densification of urban areas. Local authorities vary in their attitude of how flexible they can be with the degree of impact on the daylight and sunlight amenity enjoyed by neighbouring owners and it is one factor among many planning aspects considered when determining an application. In city centres where high density is common, the protection of amenity is more challenging and there are many factors that need to be taken into account: each case has to be considered on its own merits.

## The BRE Guidelines

The guidelines are typically referred to for daylight and sunlight amenity issues, however they were not intended to be used as an instrument of planning policy. In the introduction of 'Site Layout Planning for Daylight and Sunlight (2011)', section 1.6 (page 1), states that:-

> *"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 constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly because natural lighting is only one of many factors in site layout design (see Section 5). In special circumstances the developer or Planning Authority may wish to use different target values. For example, in an historic city centre, or in an area with modern high rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings".*

Again, the paragraph 2.2.3 (page 7) of the document states:-

> *"Note that numerical values given here are purely advisory. Different criteria may be used, based on the requirements for daylighting in an area viewed against other site layout constraints".*

The numerical criteria suggested by the BRE are therefore designed to provide industry advice/guidance to plan/design with daylight in mind. Alternative values may be appropriate in certain circumstances such as highly dense urban areas around London, for e.g. the approach to creating alternative criteria is detailed within Appendix F of the BRE.

**Measurement and Criteria for Daylight and Sunlight as set out in the BRE Guidelines**

The BRE guidelines state that they are;

> *"intended for use for rooms in adjoining dwellings where daylight is required, including living rooms, kitchens and bedroom. Windows to bathrooms, toilets, garages need not be analysed."*

They are therefore primarily designed to be used for residential properties however, the BRE guidelines continue to state that they may be applied to any existing non-residential buildings where there may be a reasonable expectation of daylight including; schools, hospitals, hostels, small workshop and some offices.

***Daylight***

In the first instance, if a proposed development falls beneath a 25 degree angle taken from the centre point of the lowest window, then the BRE suggests that no further analysis is required as there will be adequate sky light (i.e. sky visibility). This rule is applied when considering the scope of any assessments.

The BRE guidelines provide two methods for calculating daylight to existing surrounding properties:

- Vertical Sky Component (VSC)
- No Sky Line (NSL) also referred to as daylight distribution

A further method, the Average Daylight Factor (ADF) is provided for calculating daylight within proposed properties. However, it is sometimes applied as a supplementary assessment for exiting surrounding properties.

Each method is described below:

***Vertical Sky Component***

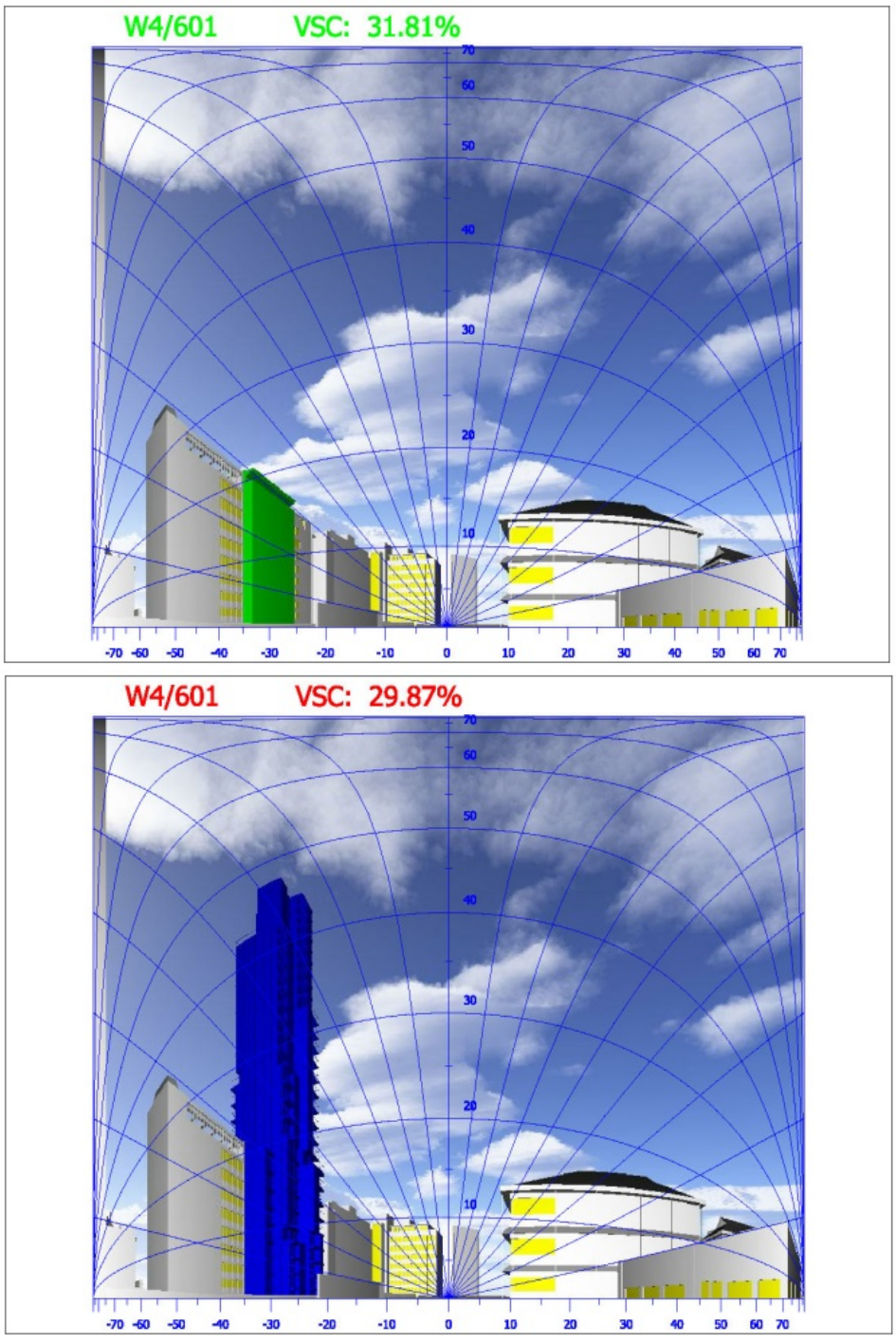
*Methodology*

This is defined in the BRE as:-

> *"Ratio of that part of illuminance, at a point on a given vertical plane that, is received directly from a CIE standard overcast sky, to illuminance on a horizontal plane due to an unobstructed hemisphere of this sky."*

This statement means, in practice that if one had a totally unobstructed view of the sky, looking in a single direction, then just under 40% of the complete hemisphere would be visible. The measurement of this vertical sky component is undertaken using two indicators, namely a skylight indicator and a transparent direction finder.

Alternatively a further method of measuring the VSC, which is easier to understand both in concept and analysis, is often more precise and can deal with more complex instructions, is that of the Waldram diagram.




The point of reference is the same as for the skylight indicator, at the centre of the outward window face. Effectively a snap shot is taken from that point of the sky in front of the window, before and after the obstruction is put in place together with all the relevant obstructions to it, i.e. the buildings.

An unobstructed sky from that point of reference would give a vertical sky component of 39.6%, corresponding to 50% of the hemisphere, and therefore the purpose of the diagram is to discover how much sky remains once obstructions exist in front of that point.

*Criteria*

The BRE Handbook provides criteria for:

(a) New Development
(b) Existing Buildings
(c) Adjoining Development Land

(a) New Development

Paragraph 2.1.21 of the BRE states that:

"Obstructions can limit access to light from the sky. This can be checked by measuring or calculating the angle of visible sky 'theta', angle of obstruction or Vertical Sky Component (VSC) at the centre of the lowest window where daylight is required. If VSC is:

- at least 27% ('theta' is greater than 65 degrees, obstruction angle less than 25 degrees) conventional window design will usually give reasonable results.
- between 15% and 27% ('theta' is between 45 degrees and 65 degrees, obstruction angle between 25 degrees and 45 degrees) special measures (larger windows, changes to room layout) are usually needed to provide adequate daylight.
- between 5% and 15% ('theta' is between 25 degrees and 45 degrees, obstruction angle between 45 degrees and 65 degrees) it is very difficult to provide adequate daylight unless very large windows are used.
- less than 5% ('theta' less than 25 degrees, obstruction angle more than 65 degrees) it is often impossible to achieve reasonable daylight, even if the whole window wall is glazed."

(b) Existing Buildings

Para 2.2.21 (page 11) of the BRE states:

*"If any part of a new building or extension measured 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 degree to the horizontal, then the diffuse daylighting of the existing building may be adversely affected. This will be the case if the vertical sky component measured at the centre of an existing main window is less than 27%, and less than 0.8 times its former value".*

The VSC provides a quick and simple test which looks to give an early indication of the potential for light at the window face. However considered in isolation, it does not, in any fashion, indicate the quality of actual light within a space. It does not take into account the window size, the room size or room use. It helps by indicating that if there is an appreciable amount of sky visible from a given point there will be a reasonable potential for daylighting.

(c) Adjoining Development Land

Paragraph 2.3.10 of the BRE guidelines states:

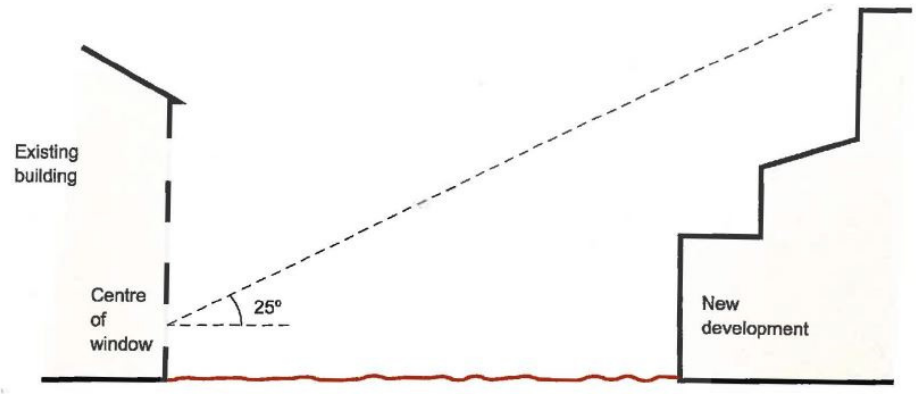
*"in broad general terms, a development site next to a proposed new building will retain the potential for good diffuse daylighting provided that on each common boundary:*

*(a) no new building, measured in a vertical section perpendicular to the boundary, from a point 1.6m above ground level, subtends an angle of more than 43 degrees to the horizontal;*

*(b) or, If (a) is not satisfied, then all points 1.6m above the boundary line are within 4m (measured along the boundary) of a point which has a VSC (looking towards the new building(s)) of 17% or more 2m above ground level are within 4m (measured sideways) of a point which has a vertical sky component of 27% or more.*

*Alternative VSC criteria as per Appendix F of the BRE guidelines*

The 27% VSC target criteria is based upon a sub-urban type environment whereby a 25 degree line was taken from the centre point on a ground floor window as shown below:




However, in city centre locations and urban areas where density levels are increasing, these values may not be considered appropriate. The BRE guidelines provide that "*different targets may be used based on the special requirements of the proposed development or its location*" (paragraph F1).

Appendix F of the BRE suggests several approaches as to how alternative targets may be considered including:

- Consented scheme - use of an extant planning permission to establish alternative benchmark criteria for VSC and APSH. It is not appropriate to treat a permitted scheme in the same manner as an existing building and allow a 20% reduction beyond this. If the levels of daylight and sunlight retained are similar to a previously consented scheme then it follows that these levels should be considered acceptable again, notwithstanding other planning considerations.
- Mirror massing – to ensure a development matches the height and proportions of existing buildings, the VSC and APSH targets could be set to those of a mirror image of the same height and size, an equal distance away from the boundary (paragraph F5).
- Consider surrounding context and existing obstruction angles as well as spacing to height ratios.

In addition, due to the requirements for external amenity space within local planning policies, many residential buildings are served by balconies. Balconies can restrict the view of the sky dome whereby even the modest obstruction may result in a large relative impact on the VSC. The BRE guidelines therefore provide that an assessment can be carried out comparing the levels of VSC with and without the balconies in place for both the existing and proposed scenarios, to establish whether it is the presence of the balcony or the size of the new obstruction that is the main factor in the loss of light (paragraph 2.2.11).

***No Sky Line***

*Methodology*

The NSL method is a measure of the distribution of daylight at the working plane within a room. The 'working plane' means a horizontal 'desktop' plane 0.85m in height for residential properties. The NSL divides those areas of the working plane which can receive direct sky light from those which cannot. If a significant area of the working plane lies beyond the NSL (i.e. it receives no direct sky light), then the distribution of daylight in the room will be poor and supplementary electric lighting may be required.

It is similar to the VSC approach in that a reduction of 0.8 times in the area of sky visibility at the working plane may be deemed to be noticeable. It is however, very dependent upon knowing the actual room layouts or having a reasonable understanding of the likely layouts.

It is assessed by plotting the area of a room which can see the sky and which cannot, referred to as the NSL contour or daylight distribution contour. The contours assist in helping to understand the way the daylight is distributed within a room and the comparisons of existing and limitations of proposed circumstances within neighbouring properties. Like the VSC method, it relates to the amount of visible sky but does not consider the room use in its criteria, it is simply a test to assess the change in position of the No Sky Line, between the existing and proposed situation. It does take into account the number and size of windows to a room, but does not give any quantitative or qualitative assessment of the light in the rooms, only where sky can or cannot be seen.

*Criteria*

BS 8206 Part 2 (para 5.7) that the:

> *"uniformity of daylight is considered to be unsatisfactory if a significant part of the working plane (normally more than 20%) lies behind the no-sky line".*

Therefore, it is implied that an NSL of at least 80% would be considered satisfactory in regards to deep rooms which are lit by windows on one side, the BRE Guidelines state (para, 2.2.10):

In regards to the alteration as a result of a proposed development or obstruction the BRE provide that the daylight may be adversely affected if *" the area of the working plane in a room which can receive direct skylight is reduced to less than 0.8 times its former value. ".*

***Average Daylight Factor***

*Methodology*

The Average Daylight Factor (ADF) is defined within the 2011 BRE Guidelines as:

> *'a ratio of total daylight flux incident on a reference area to the total area of the reference area, expressed as a percentage of outdoor luminance on a horizontal plane, due to an unobstructed sky of assumed or known luminance distribution'.*

Whilst the BRE guidelines provide this measure as a tool to understand daylight within proposed dwellings not existing dwellings, if room layouts are known it can provide a useful supplementary measure of daylight and is often requested by many local authorities.

The ADF method of assessment considers:

- The diffuse visible transmittance of the glazing to the room in question (i.e. how much light gets through the window glass). A transmittance value of 0.8% is assumed for single glazing and 0.65% for double glazed windows;
- The net glazed area of the window in question;
- The total area of the room surfaces (ceiling, walls, floor and windows); and
- The angle of visible sky reaching the window(s) in question

In addition, the ADF method makes allowance for the average reflectance of the internal surfaces of the room and of external obstruction (assumed to be 0.5 unless otherwise stated).

*Criteria*

The criteria for ADF is taken from the British Standard 8206 part II which gives the following criteria based on the room use:

- Bedroom – 1% ADF
- Living room – 1.5% ADF
- Kitchen – 2% ADF

Where a room has multiple uses such as a living kitchen diner (LKD) or a studio apartment, the highest value is taken so in these cases the required ADF is 2%.

***Sunlight***

*Methodology*

The BS 8206 part 2 (section 5.2) states that:

> *"Provided that the entry of sunlight is properly controlled, it is generally welcome in most buildings in the UK. Dissatisfaction can arise as much from the permanent exclusion of sunlight as from its excess. The provision of sunlight is important in dwellings, particularly during winter months. Sunlight is especially valued in habitable rooms used for long periods during the day."*

## Principles of Daylight and Sunlight

Sunlight is measured using a sun indicator which contains 100 spots, each representing 1% of Annual Probable Sunlight Hours (APSH). Where no obstruction exists the total APSH would amount to 1486 hours and therefore each spot equates to 14.86 hours of the total annual sunlight hours.

The number of spots is calculated for both the whole year and also during the winter period (21st September to 21st March) prior to an obstruction and after the obstruction is put in place. This provides a percentage of APSH for each of the time periods for each window assessed. The 2011 BRE Guidelines note that:

- *"In housing, the main requirement for sunlight is in living rooms, where it is valued at any time of day, but especially in the afternoon."*

- *"all main living rooms of dwellings…should be checked if they have a window facing within 90° of due south. Kitchens and bedrooms are less important, although care should be taken not to block too much sun";*

- *"If the main living room to a dwelling has a main window facing within 90° of due north, but a secondary window facing within 90° of due south, sunlight to the secondary window should be checked."*

- *"…a south facing window will, in general, receive most sunlight, while a north facing one will receive it only on a handful of occasions. East and west facing windows will receive sunlight only at certain times of day".*

When a room has multiple windows, not all may have a southerly orientation however, these windows may contribute to the levels of sunlight within a given room even if by 1-2% APSH. As well as the assessment on a window basis the BRE guidelines provide that an assessment can be undertaken on a room basis.

Whilst the emphasis of the BRE guidelines is in regards to living rooms, it is not always possible to determine the room uses within all of the properties assessed and therefore typically all windows or all rooms with windows facing within 90 degrees of due south and facing the site are assessed.

*Criteria*

The BRE provide that for existing buildings a window maybe adversely affected if a point at the centre of a window receives:

- Less than 25% of the APSH during the whole year, of which 5% APSH must be in the winter period; and
- Receives less than 0.8 times its former sunlight hours in either time period; and
- Has a reduction in sunlight for the whole year more than 4% APSH.

In terms of the assessment on a room basis the criteria applied is the same.

For proposed buildings the BRE provide (paragraph 3.1.15) that a dwelling or building which has a particular requirement for sunlight will appear reasonably sunlit provided:

- At least one main window faces within 90 degrees of due south; and

- Centre of one main living room window can receive 25% of APSH including 5% APSH in the winter months.

It continues that where groups of dwellings are planned the layout should aim to maximise the number of living rooms that meet the above recommendations.

***Overshadowing***

As well as daylight and sunlight amenity to neighbouring dwellings, planning policy often refers to the levels of overshadowing to amenity areas such as parks, public squares, playgrounds etc. The BRE guidelines provide two methods of calculation in regards to overshadowing which are as follows:

***Sun Hours on Ground***

*Methodology*

This method of overshadowing assessment uses the sun on ground indicator to determine the areas which receive direct sunlight and those which do not. This method applies to both new and existing areas of amenity space. The BRE Guidelines suggest that the Spring Equinox (21st March) is a suitable date for the assessment as this is the midpoint of the suns position throughout the year. Using specialist software, the path of the sun is tracked to determine where the sun would reach the ground and where it would not.

*Criteria*

The BRE guidelines recommend that at least half of an amenity space should receive at least two hours of direct sunlight on March 21st. In regards to existing spaces where the existing sunlit area is less than half of the area, the area which receives two hours of sunlight should not be reduced by more than 20% (it should retain 0.8 times its former value).

*Transient Overshadowing*

The BRE guidelines suggest that where large buildings are proposed which may affect a number of gardens or open spaces, it is useful to plot a shadow plan to illustrate the location of shadows at different times of the day and year. For the purpose of this assessment, shadow has been mapped at the following times of the year:

- 21st March (Spring equinox)
- 21st June (Summer solstice)
- 21st December (Winter solstice)

The September equinox is not assessed as this would provide the same results as those for March 21st.

For each of these dates the overshadowing is calculated at hourly intervals throughout the day however some images may not be present given the early sunset during the Winter period.

The BRE guidelines do not provide any criteria for transient overshadowing. Therefore the analysis provides a description of where additional shadow is cast as a result of a development with professional judgement to determine the effect comparing the shadow resulting from the proposed development against that of the existing site.

***Light pollution and Solar Glare***

Light pollution is defined as any light emitting from artificial sources into spaces where it is not wanted for example from offices into neighbouring residential properties where it could cause a nuisance. The ILP Guidance notes provide details of how to measure light pollution and criteria based on the urban density of the respective area to determine the acceptability of the light levels.

Solar glare is particularly important at pedestrian and road junctions as well as along railway lines where the glare can cause a temporary blinding to drivers or pedestrians. Glare can occur from reflective materials such as glazed areas or metal cladding on the facades. This assessment is therefore undertaken from viewpoints surrounding the site at junctions and positioned at the driver's eye level. Focal points are dictated by the location of signals or oncoming traffic.

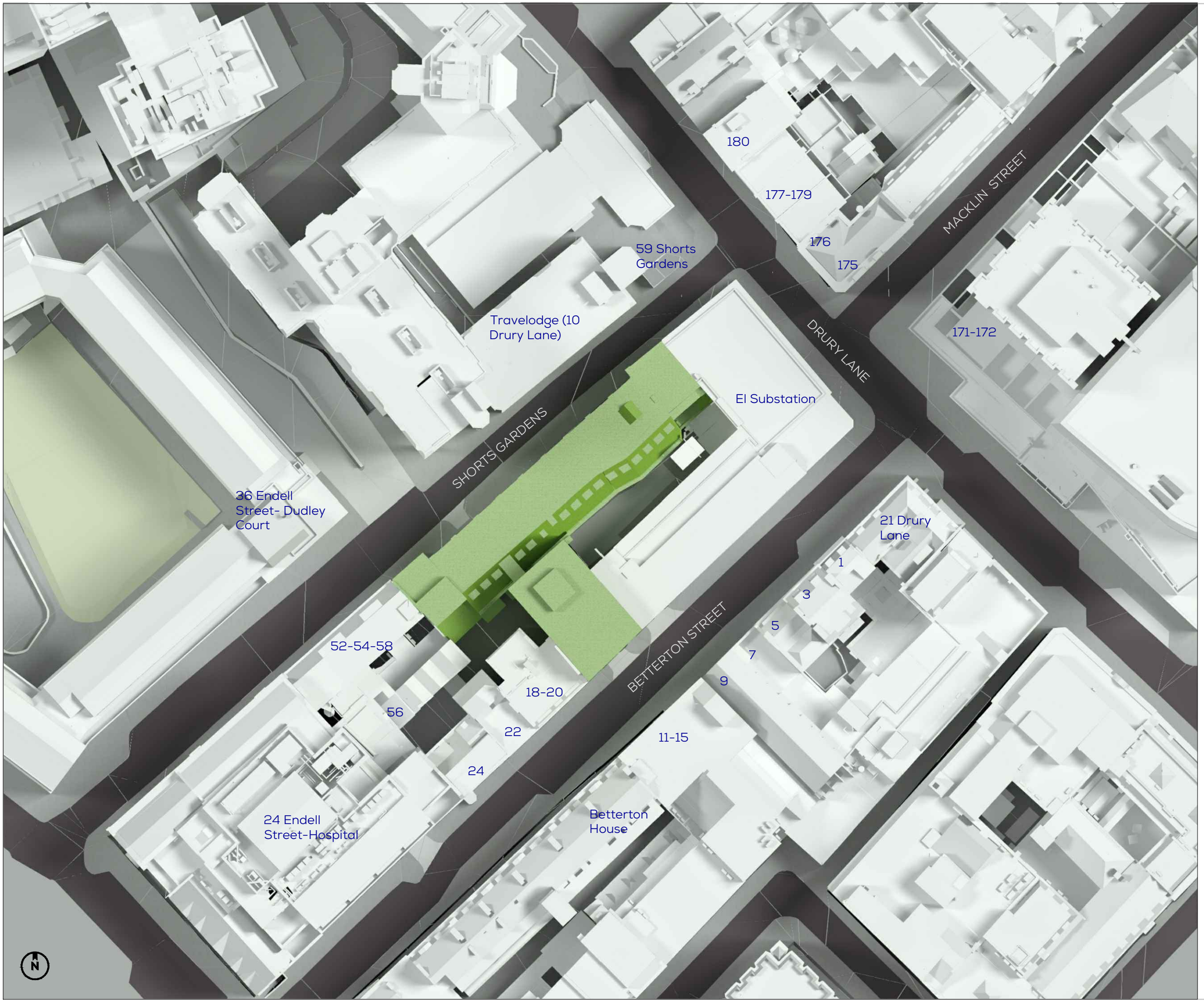
***Other Amenity Considerations***

Daylight and sunlight is one factor among many under the heading of residential amenity considerations for any given development design or planning application; others include:

- outlook
- sense of enclosure
- privacy
- access to outdoor space e.g. balconies or communal garden/courtyard

# Appendix 02

*Drawings*




SOURCES OF INFORMATION

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PROJECT:
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DRAWING NAME:
PLAN VIEW EXISTING
EXISTING SCENARIO

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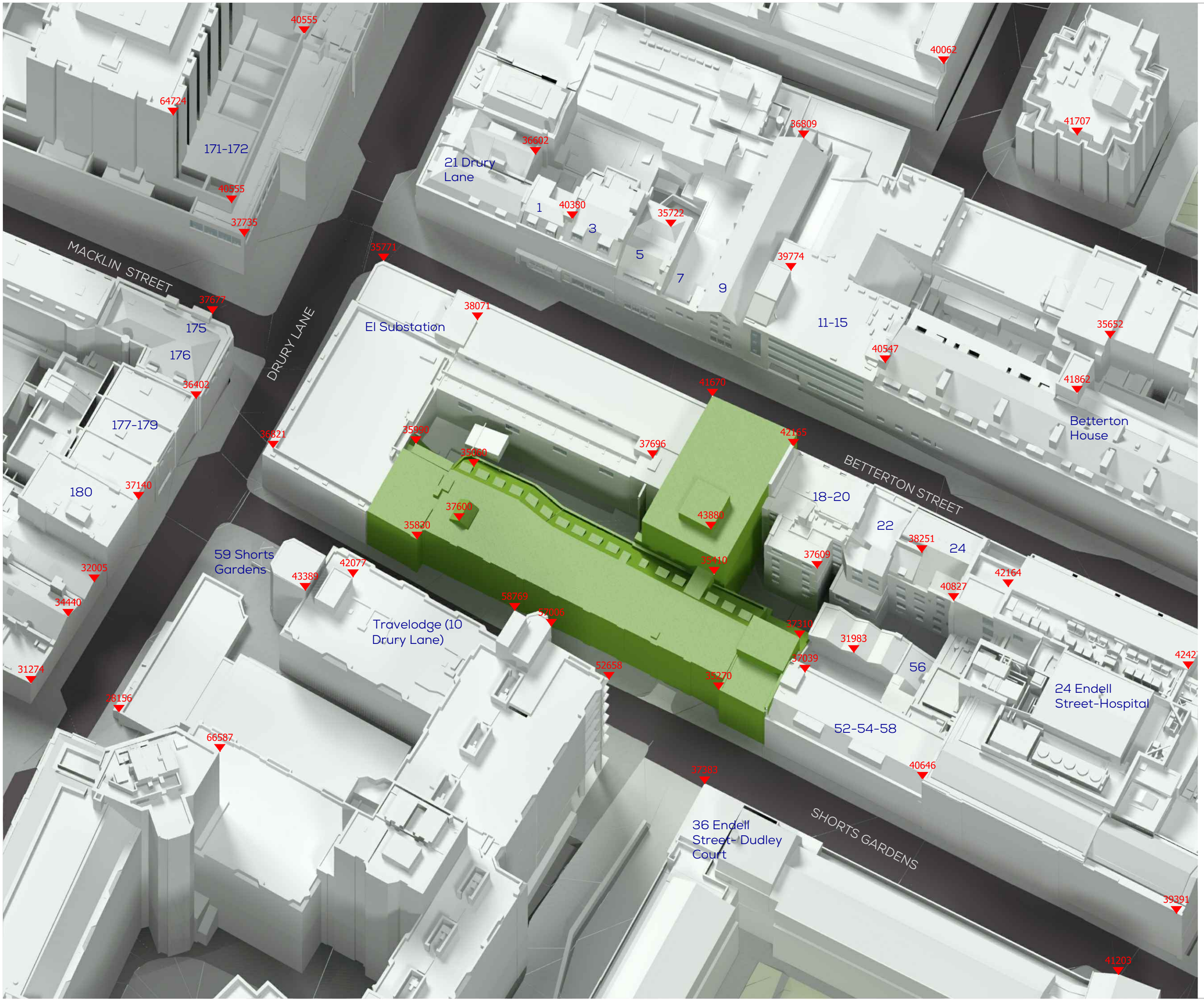


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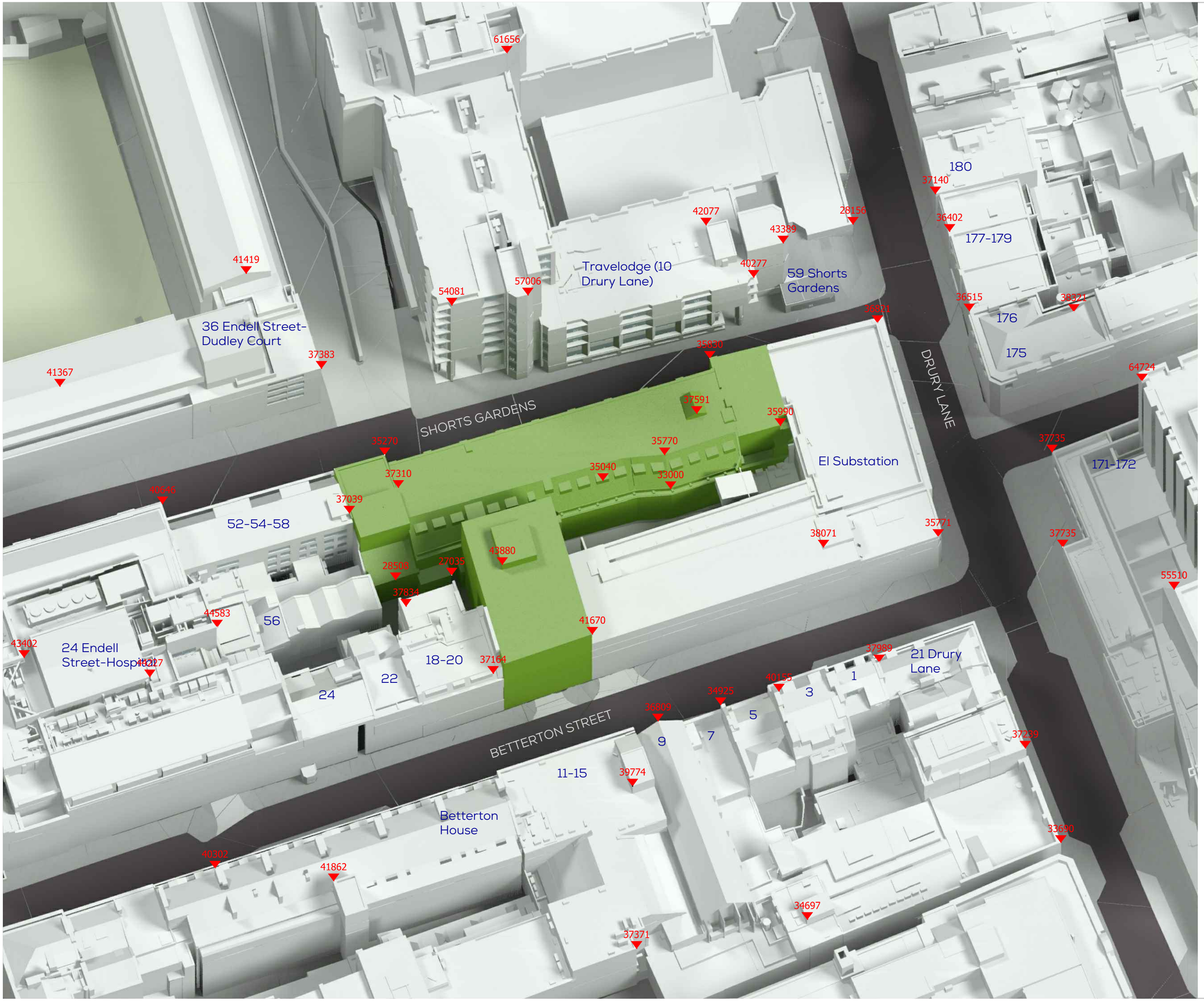


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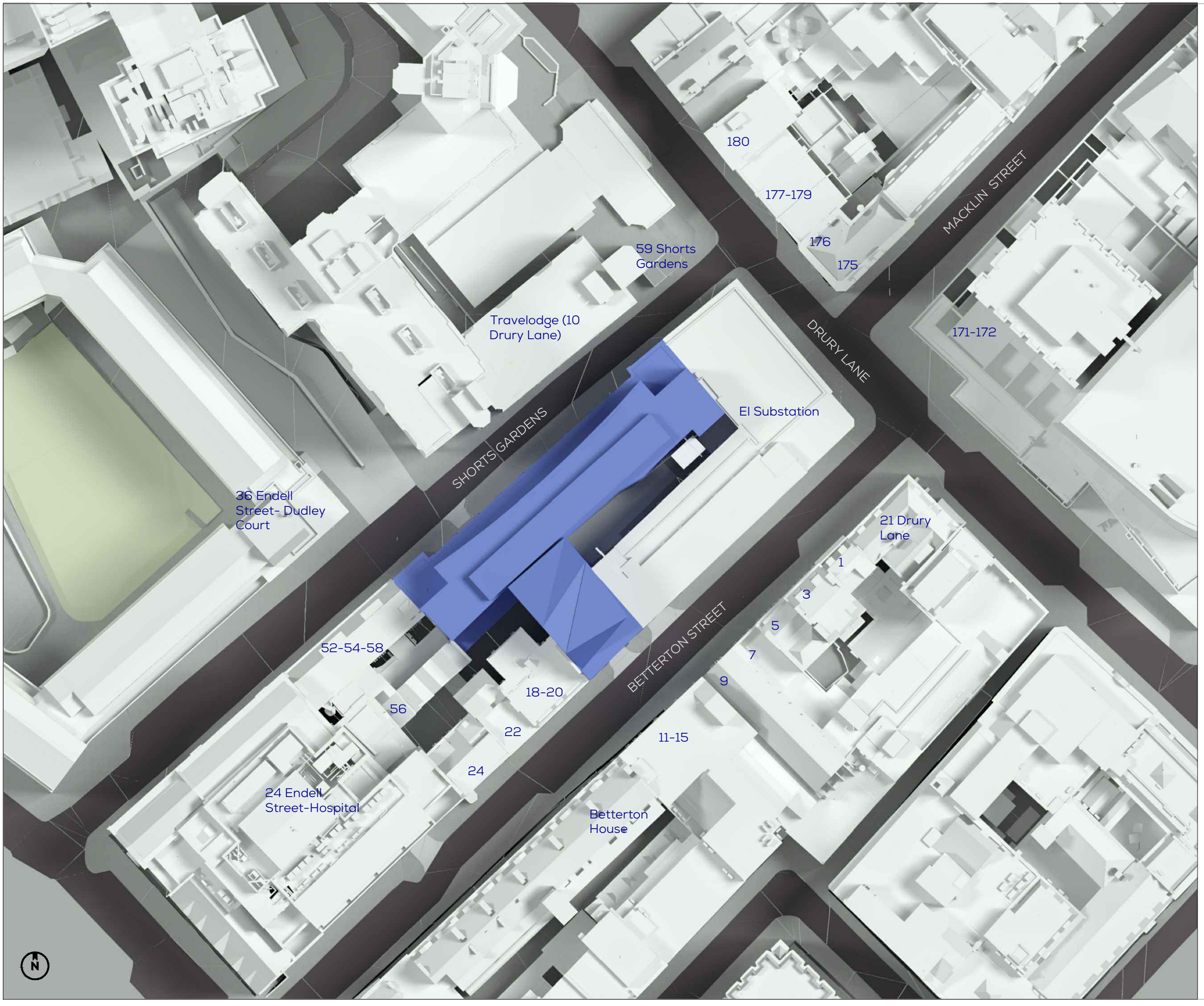
*Proposed*

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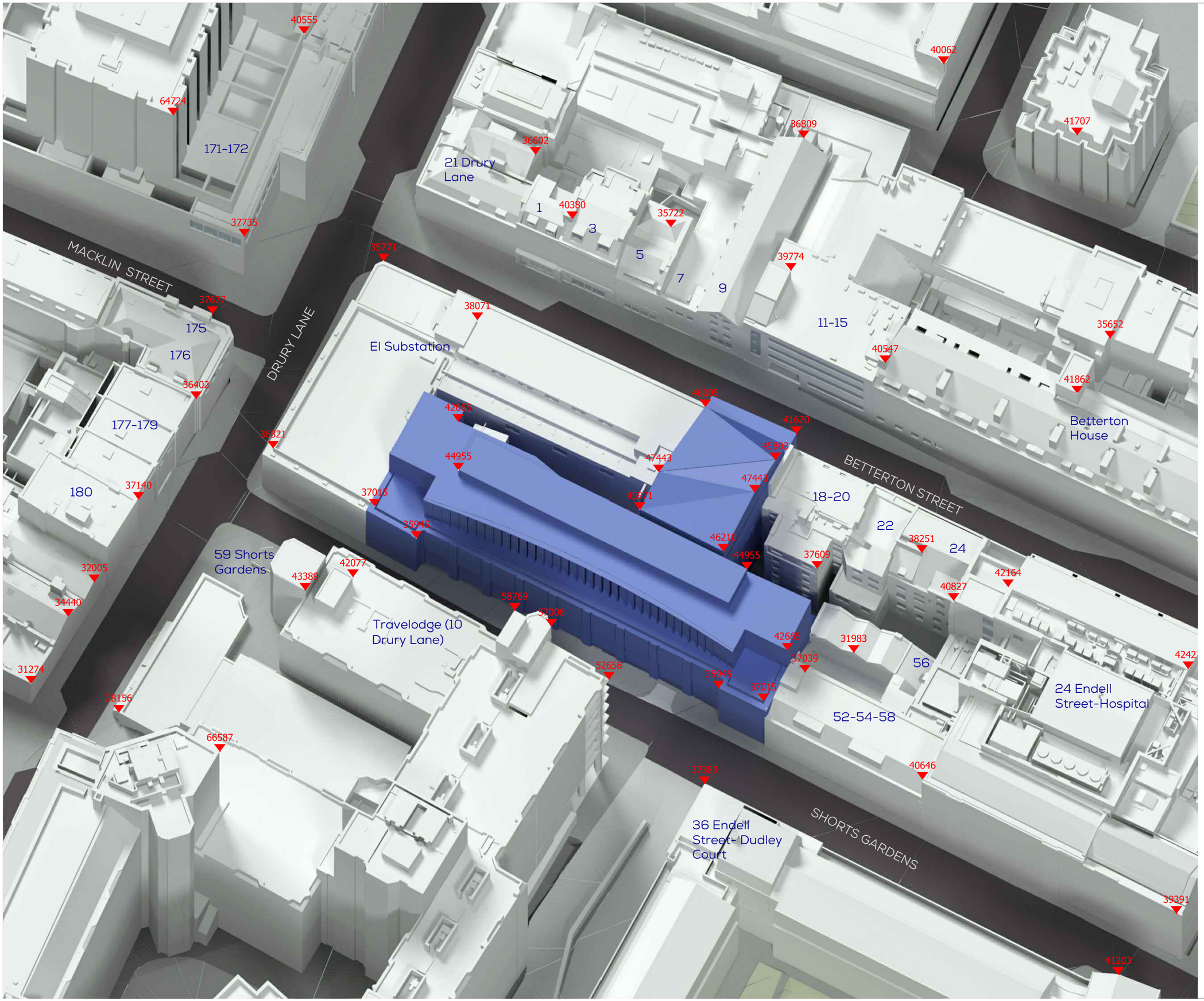


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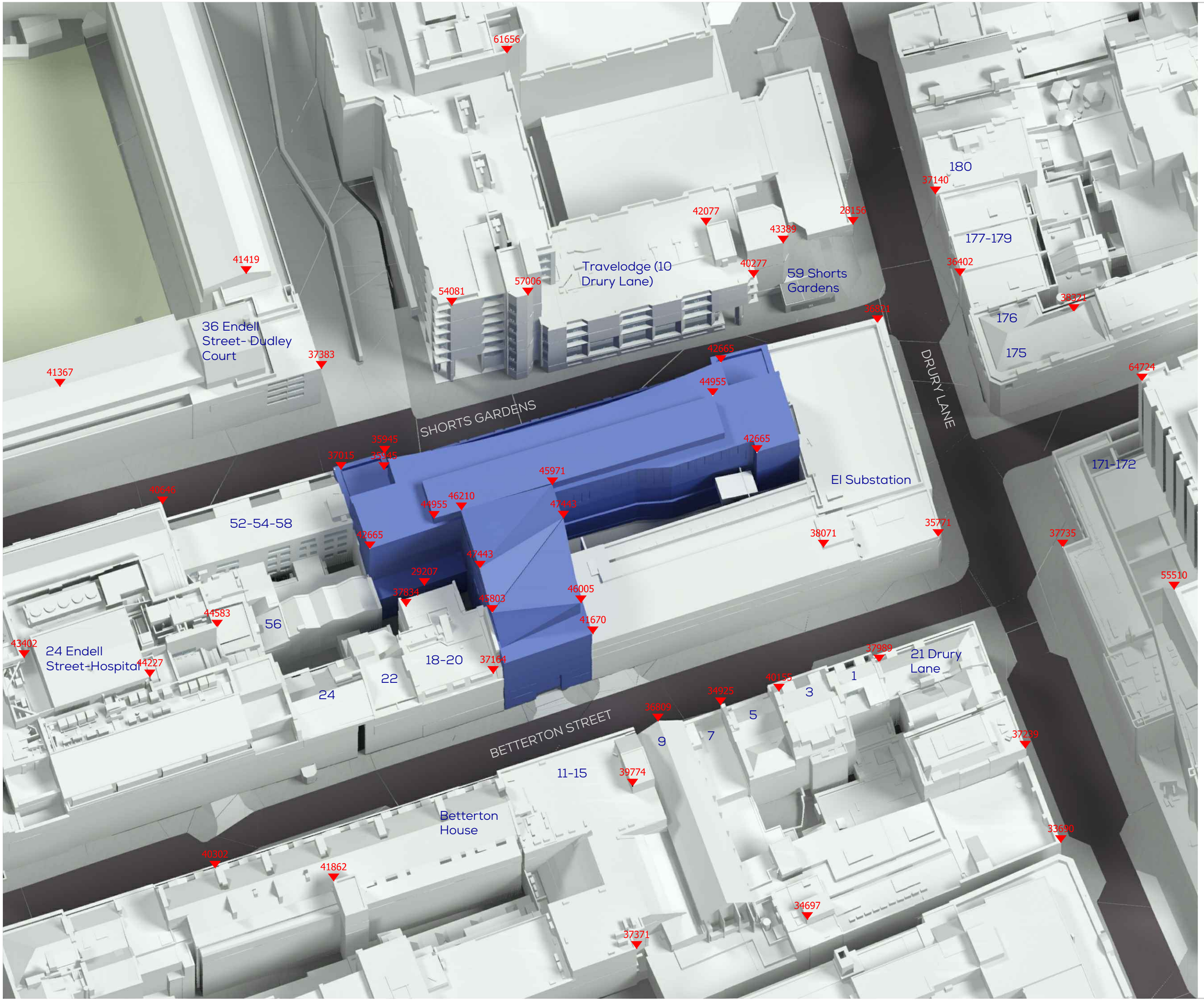


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# Appendix 03

*Daylight and Sunlight Results*

| Vertical Sky Component | | | | | | |
|---|---|---|---|---|---|---|
| **Room** | **Window** | **Room Use** | **Existing** | **Proposed** | **Loss** | **%** |
| **18-20 Betterton St** | | | | | | |
| **R1/F00** | **W1/F00** | Kitchen-Resi | 2.8 | 0.6 | 2.2 | 78.6 |
| **R1/F00** | **W2/F00** | Kitchen-Resi | 2.3 | 0.5 | 1.8 | 78.3 |
| **R1/F00** | **W3/F00** | Kitchen-Resi | 2.4 | 0.2 | 2.2 | 91.7 |
| **R2/F00** | **W4/F00** | Bedroom | 7.7 | 2.5 | 5.2 | 67.5 |
| **R2/F00** | **W9/F00** | Bedroom | 0.4 | 0.2 | 0.2 | 50.0 |
| **R3/F00** | **W5/F00** | Bedroom | 7.8 | 2.7 | 5.1 | 65.4 |
| **R4/F00** | **W6/F00** | Kitchen-Resi | 2.5 | 1.5 | 1.0 | 40.0 |
| **R4/F00** | **W7/F00** | Kitchen-Resi | 2.0 | 0.8 | 1.2 | 60.0 |
| **R4/F00** | **W8/F00** | Kitchen-Resi | 2.0 | 0.8 | 1.2 | 60.0 |
| **R1/F01** | **W1/F01** | Kitchen-Resi | 4.1 | 1.0 | 3.1 | 75.6 |
| **R2/F01** | **W2/F01** | Bedroom | 11.7 | 3.6 | 8.1 | 69.2 |
| **R2/F01** | **W5/F01** | Bedroom | 0.6 | 0.2 | 0.4 | 66.7 |
| **R3/F01** | **W3/F01** | Bedroom | 13.1 | 5.5 | 7.6 | 58.0 |
| **R4/F01** | **W4/F01** | Kitchen-Resi | 7.1 | 5.4 | 1.7 | 23.9 |
| **R1/F02** | **W1/F02** | Kitchen-Resi | 5.6 | 1.4 | 4.2 | 75.0 |
| **R2/F02** | **W2/F02** | Bedroom | 16.1 | 4.6 | 11.5 | 71.4 |
| **R2/F02** | **W5/F02** | Bedroom | 0.9 | 0.3 | 0.6 | 66.7 |
| **R3/F02** | **W3/F02** | Bedroom | 18.7 | 8.2 | 10.5 | 56.1 |
| **R4/F02** | **W4/F02** | Kitchen-Resi | 12.9 | 10.8 | 2.1 | 16.3 |
| **R1/F03** | **W1/F03** | Kitchen-Resi | 7.3 | 2.7 | 4.6 | 63.0 |
| **R2/F03** | **W2/F03** | Bedroom | 21.2 | 6.2 | 15.0 | 70.8 |
| **R2/F03** | **W5/F03** | Bedroom | 1.4 | 0.5 | 0.9 | 64.3 |
| **R3/F03** | **W3/F03** | Bedroom | 24.5 | 10.7 | 13.8 | 56.3 |
| **R4/F03** | **W4/F03** | Kitchen-Resi | 15.8 | 13.3 | 2.5 | 15.8 |
| **R1/F04** | **W1/F04** | Kitchen-Resi | 10.9 | 5.7 | 5.2 | 47.7 |
| **R2/F04** | **W2/F04** | Bedroom | 25.4 | 9.4 | 16.0 | 63.0 |
| **R2/F04** | **W5/F04** | Bedroom | 2.5 | 0.8 | 1.7 | 68.0 |
| **R3/F04** | **W3/F04** | Bedroom | 28.9 | 14.3 | 14.6 | 50.5 |
| **R4/F04** | **W4/F04** | Kitchen-Resi | 19.9 | 17.3 | 2.6 | 13.1 |
| **24 Betterton St** | | | | | | |
| **R1/B01** | **W1/B01** | Bedroom | 3.6 | 3.6 | 0.0 | 0.0 |
| **R2/B01** | **W2/B01** | Bedroom | 5.2 | 5.0 | 0.2 | 3.8 |
| **R4/F00** | **W1/F00** | Study | 6.3 | 6.3 | 0.0 | 0.0 |
| **R1/F01** | **W1/F01** | Bedroom | 15.2 | 13.7 | 1.5 | 9.9 |
| **R3/F01** | **W3/F01** | Kitchen-Resi | 17.1 | 15.5 | 1.6 | 9.4 |

| Vertical Sky Component | | | | | | |
|---|---|---|---|---|---|---|
| **Room** | **Window** | **Room Use** | **Existing** | **Proposed** | **Loss** | **%** |
| **R1/F02** | **W1/F02** | Bedroom | 21.6 | 19.9 | 1.7 | 7.9 |
| **1 Betterton Street** | | | | | | |
| **R1/F04** | **W1/F04** | Unknown-Resi | 33.2 | 32.3 | 0.9 | 2.7 |
| **R1/F04** | **W2/F04** | Unknown-Resi | 33.0 | 32.0 | 1.0 | 3.0 |
| **R1/F04** | **W3/F04** | Unknown-Resi | 29.9 | 29.9 | 0.0 | 0.0 |
| **R1/F04** | **W4/F04** | Unknown-Resi | 22.7 | 22.7 | 0.0 | 0.0 |
| **3 Betterton Street** | | | | | | |
| **R1/F04** | **W1/F04** | Unknown-Resi | 33.4 | 32.4 | 1.0 | 3.0 |
| **R1/F04** | **W2/F04** | Unknown-Resi | 33.3 | 31.9 | 1.4 | 4.2 |
| **5 Betterton Street** | | | | | | |
| **R1/F03** | **W1/F03** | Unknown-Resi | 28.5 | 27.2 | 1.3 | 4.6 |
| **R1/F03** | **W2/F03** | Unknown-Resi | 28.5 | 27.1 | 1.4 | 4.9 |
| **R1/F03** | **W3/F03** | Unknown-Resi | 27.9 | 26.4 | 1.5 | 5.4 |
| **9 Betterton Street** | | | | | | |
| **R1/F01** | **W1/F01** | Living Room | 16.4 | 16.1 | 0.3 | 1.8 |
| **R1/F01** | **W2/F01** | Living Room | 16.2 | 16.0 | 0.2 | 1.2 |
| **R1/F02** | **W1/F02** | Bedroom | 22.4 | 21.6 | 0.8 | 3.6 |
| **R1/F02** | **W2/F02** | Bedroom | 22.1 | 21.4 | 0.7 | 3.2 |
| **R1/F03** | **W1/F03** | Bedroom | 27.4 | 25.8 | 1.6 | 5.8 |
| **R1/F03** | **W2/F03** | Bedroom | 27.0 | 25.5 | 1.5 | 5.6 |
| **R1/F03** | **W3/F03** | Bedroom | 29.6 | 27.5 | 2.1 | 7.1 |
| **Betterton House** | | | | | | |
| **R1/F00** | **W1/F00** | Unknown-Resi | 12.1 | 12.0 | 0.1 | 0.8 |
| **R1/F00** | **W2/F00** | Unknown-Resi | 12.3 | 12.2 | 0.1 | 0.8 |
| **R1/F00** | **W3/F00** | Unknown-Resi | 12.5 | 12.4 | 0.1 | 0.8 |
| **R2/F00** | **W3/F00** | Unknown-Resi | 12.5 | 12.4 | 0.1 | 0.8 |
| **R2/F00** | **W4/F00** | Unknown-Resi | 12.6 | 12.5 | 0.1 | 0.8 |
| **R1/F04** | **W1/F04** | Unknown-Resi | 32.0 | 30.5 | 1.5 | 4.7 |
| **R2/F04** | **W2/F04** | Unknown-Resi | 32.3 | 31.2 | 1.1 | 3.4 |
| **36 Endell Street-Dudley Court** | | | | | | |
| **R1/F01** | **W1/F01** | Unknown-Resi | 0.0 | 0.0 | 0.0 | 0.0 |
| **R2/F01** | **W2/F01** | Unknown-Resi | 1.6 | 1.6 | 0.0 | 0.0 |
| **R2/F01** | **W3/F01** | Unknown-Resi | 3.2 | 3.2 | 0.0 | 0.0 |
| **R2/F01** | **W4/F01** | Unknown-Resi | 23.3 | 20.2 | 3.1 | 13.3 |
| **R2/F01** | **W5/F01** | Unknown-Resi | 12.6 | 10.9 | 1.7 | 13.5 |
| **R3/F01** | **W6/F01** | Unknown-Resi | 11.6 | 10.0 | 1.6 | 13.8 |
| **R1/F02** | **W1/F02** | Unknown-Resi | 0.6 | 0.5 | 0.1 | 16.7 |
| **R2/F02** | **W2/F02** | Unknown-Resi | 2.7 | 2.7 | 0.0 | 0.0 |
| **R2/F02** | **W3/F02** | Unknown-Resi | 4.5 | 4.5 | 0.0 | 0.0 |
| **R2/F02** | **W4/F02** | Unknown-Resi | 27.9 | 24.3 | 3.6 | 12.9 |
| **R2/F02** | **W5/F02** | Unknown-Resi | 14.1 | 12.4 | 1.7 | 12.1 |

**Vertical Sky Component**

| Room | Window | Room Use | Existing | Proposed | Loss | % |
|---|---|---|---|---|---|---|
| **R3/F02** | **W6/F02** | Unknown-Resi | 13.0 | 11.5 | 1.5 | 11.5 |
| **R1/F03** | **W1/F03** | Unknown-Resi | 2.9 | 2.0 | 0.9 | 31.0 |
| **R2/F03** | **W2/F03** | Unknown-Resi | 3.8 | 3.8 | 0.0 | 0.0 |
| **R2/F03** | **W3/F03** | Unknown-Resi | 5.7 | 5.7 | 0.0 | 0.0 |
| **R2/F03** | **W4/F03** | Unknown-Resi | 31.8 | 28.4 | 3.4 | 10.7 |
| **R2/F03** | **W5/F03** | Unknown-Resi | 15.6 | 14.1 | 1.5 | 9.6 |
| **R3/F03** | **W6/F03** | Unknown-Resi | 14.5 | 13.1 | 1.4 | 9.7 |
| **R1/F04** | **W1/F04** | Unknown-Resi | 4.4 | 3.0 | 1.4 | 31.8 |
| **R2/F04** | **W2/F04** | Unknown-Resi | 4.6 | 4.6 | 0.0 | 0.0 |
| **R2/F04** | **W3/F04** | Unknown-Resi | 6.7 | 6.7 | 0.0 | 0.0 |
| **R2/F04** | **W4/F04** | Unknown-Resi | 34.6 | 31.7 | 2.9 | 8.4 |
| **R2/F04** | **W5/F04** | Unknown-Resi | 17.3 | 16.1 | 1.2 | 6.9 |
| **R3/F04** | **W6/F04** | Unknown-Resi | 16.1 | 15.1 | 1.0 | 6.2 |
| **175 Drury Lane** | | | | | | |
| **R1/F03** | **W1/F03** | Unknown-Resi | 30.3 | 29.5 | 0.8 | 2.6 |
| **R1/F03** | **W2/F03** | Unknown-Resi | 30.5 | 29.7 | 0.8 | 2.6 |
| **R1/F03** | **W3/F03** | Unknown-Resi | 25.5 | 25.5 | 0.0 | 0.0 |
| **176 Drury Lane** | | | | | | |
| **R1/F03** | **W1/F03** | Unknown-Resi | 29.8 | 29.1 | 0.7 | 2.3 |
| **R1/F03** | **W2/F03** | Unknown-Resi | 30.0 | 29.3 | 0.7 | 2.3 |
| **177-179 Drury Lane** | | | | | | |
| **R1/F03** | **W1/F03** | Unknown-Resi | 28.6 | 27.6 | 1.0 | 3.5 |
| **R1/F03** | **W2/F03** | Unknown-Resi | 28.8 | 27.9 | 0.9 | 3.1 |

| Room/ Floor | Room Use | Flat Number | Whole Room | Prev sq ft | New sq ft | Loss sq ft | %Loss |
|---|---|---|---|---|---|---|---|
| **18-20 Betterton St** | | | | | | | |
| **R1/F00** | Kitchen-Resi | | 67.90 | 18.42 | 1.65 | 16.77 | 91.05 |
| **R2/F00** | Bedroom | | 117.44 | 18.62 | 6.97 | 11.65 | 62.56 |
| **R3/F00** | Bedroom | | 133.82 | 21.63 | 11.40 | 10.23 | 47.30 |
| **R4/F00** | Kitchen-Resi | | 69.17 | 16.14 | 14.55 | 1.59 | 9.85 |
| **R1/F01** | Kitchen-Resi | | 67.90 | 38.75 | 9.24 | 29.51 | 76.16 |
| **R2/F01** | Bedroom | | 117.44 | 34.41 | 8.22 | 26.18 | 76.10 |
| **R3/F01** | Bedroom | | 133.82 | 51.63 | 32.34 | 19.29 | 37.36 |
| **R4/F01** | Kitchen-Resi | | 69.26 | 49.96 | 49.27 | 0.69 | 1.39 |
| **R1/F02** | Kitchen-Resi | | 67.90 | 39.70 | 13.22 | 26.48 | 66.70 |
| **R2/F02** | Bedroom | | 117.44 | 45.53 | 8.48 | 37.05 | 81.38 |
| **R3/F02** | Bedroom | | 133.82 | 62.61 | 39.78 | 22.84 | 36.47 |
| **R4/F02** | Kitchen-Resi | | 69.19 | 54.57 | 53.81 | 0.76 | 1.39 |
| **R1/F03** | Kitchen-Resi | | 67.90 | 41.74 | 20.38 | 21.36 | 51.17 |
| **R2/F03** | Bedroom | | 117.44 | 83.77 | 10.89 | 72.88 | 87.00 |
| **R3/F03** | Bedroom | | 133.82 | 105.57 | 52.31 | 53.26 | 50.45 |
| **R4/F03** | Kitchen-Resi | | 69.19 | 56.62 | 55.91 | 0.71 | 1.25 |
| **R1/F04** | Kitchen-Resi | | 67.90 | 45.99 | 29.96 | 16.02 | 34.84 |
| **R2/F04** | Bedroom | | 113.50 | 89.36 | 16.41 | 72.95 | 81.64 |
| **R3/F04** | Bedroom | | 126.34 | 122.77 | 68.26 | 54.50 | 44.40 |
| **R4/F04** | Kitchen-Resi | | 69.27 | 58.28 | 57.42 | 0.87 | 1.49 |
| **24 Betterton St** | | | | | | | |
| **R1/B01** | Bedroom | | 61.95 | 0.00 | 0.00 | 0.00 | 0.00 |
| **R2/B01** | Bedroom | | 107.89 | 20.01 | 18.76 | 1.25 | 6.24 |
| **R4/F00** | Study | | 73.59 | 34.40 | 34.30 | 0.10 | 0.30 |
| **R1/F01** | Bedroom | | 72.99 | 70.72 | 70.72 | 0.00 | 0.00 |
| **R3/F01** | Kitchen-Resi | | 110.17 | 93.90 | 93.16 | 0.74 | 0.78 |
| **R1/F02** | Bedroom | | 59.97 | 57.10 | 57.09 | 0.00 | 0.00 |
| **1 Betterton Street** | | | | | | | |
| **R1/F04** | Unknown-Resi | | 154.08 | 151.30 | 150.77 | 0.54 | 0.36 |
| **3 Betterton Street** | | | | | | | |
| **R1/F04** | Unknown-Resi | | 219.93 | 211.07 | 210.66 | 0.42 | 0.20 |
| **5 Betterton Street** | | | | | | | |
| **R1/F03** | Unknown-Resi | | 191.48 | 116.09 | 102.02 | 14.07 | 12.12 |
| **9 Betterton Street** | | | | | | | |
| **R1/F01** | Living Room | | 493.11 | 67.74 | 67.70 | 0.04 | 0.06 |
| **R1/F02** | Bedroom | | 303.48 | 143.81 | 140.58 | 3.23 | 2.24 |
| **R1/F03** | Bedroom | | 346.81 | 269.78 | 236.83 | 32.95 | 12.21 |
| **Betterton House** | | | | | | | |
| **R1/F00** | Unknown-Resi | | 178.99 | 51.30 | 51.11 | 0.19 | 0.37 |
| **R2/F00** | Unknown-Resi | | 106.42 | 34.66 | 34.66 | 0.00 | 0.01 |
| **R1/F04** | Unknown-Resi | | 133.59 | 129.91 | 129.91 | 0.00 | 0.00 |
| **R2/F04** | Unknown-Resi | | 154.02 | 149.71 | 148.46 | 1.25 | 0.84 |
| **36 Endell Street-Dudley Court** | | | | | | | |
| **R1/F01** | Unknown-Resi | | 98.42 | 10.52 | 9.93 | 0.59 | 5.64 |
| **R2/F01** | Unknown-Resi | | 171.95 | 96.18 | 96.12 | 0.06 | 0.06 |
| **R3/F01** | Unknown-Resi | | 53.82 | 5.41 | 5.39 | 0.02 | 0.36 |
| **R1/F02** | Unknown-Resi | | 98.42 | 50.15 | 43.77 | 6.38 | 12.72 |
| **R2/F02** | Unknown-Resi | | 171.95 | 156.28 | 156.23 | 0.05 | 0.03 |
| **R3/F02** | Unknown-Resi | | 53.82 | 6.31 | 6.30 | 0.01 | 0.16 |
| **R1/F03** | Unknown-Resi | | 98.42 | 93.44 | 80.04 | 13.41 | 14.35 |
| **R2/F03** | Unknown-Resi | | 171.95 | 169.37 | 169.37 | 0.00 | 0.00 |
| **R3/F03** | Unknown-Resi | | 53.82 | 7.05 | 7.05 | 0.00 | 0.06 |
| **R1/F04** | Unknown-Resi | | 98.42 | 93.46 | 85.73 | 7.74 | 8.28 |
| **R2/F04** | Unknown-Resi | | 171.95 | 169.37 | 169.37 | 0.00 | 0.00 |
| **R3/F04** | Unknown-Resi | | 53.82 | 7.73 | 7.73 | 0.00 | 0.01 |
| **175 Drury Lane** | | | | | | | |

DAYLIGHT DISTRIBUTION ANALYSIS

| Room/ Floor | Room Use | Flat Number | Whole Room | Prev sq ft | New sq ft | Loss sq ft | %Loss |
|---|---|---|---|---|---|---|---|
| **R1/F03** | Unknown-Resi | | 202.47 | 199.64 | 199.64 | 0.00 | 0.00 |
| **176 Drury Lane** | | | | | | | |
| **R1/F03** | Unknown-Resi | | 177.04 | 175.10 | 175.10 | 0.00 | 0.00 |
| **177-179 Drury Lane** | | | | | | | |
| **R1/F03** | Unknown-Resi | | 191.66 | 182.53 | 182.53 | 0.00 | 0.00 |

*Annual Probable Sunlight Hours (APSH)*

| | | | | | Window | | | | | | | | Room | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Existing | | Proposed | | | | | | Existing | | Proposed | | | |
| Room | Window | Room Use | Flat Number | Orientation | Winter APSH | Annual APSH | Winter APSH | Annual APSH | Winter Loss | Annual Loss | Winter %Loss | Annual %Loss | Winter APSH | Annual APSH | Winter APSH | Annual APSH | Winter %Loss | Annual %Loss |
| **1 Betterton Street** | | | | | | | | | | | | | | | | | | |
| **R1/F04** | W1/F04 | Unknown-Resi | | -45 | 4 | 22 | 4 | 21 | 0 | 1 | 0.00 | 4.55 | | | | | | |
| **R1/F04** | W2/F04 | Unknown-Resi | | -45 | 3 | 21 | 3 | 20 | 0 | 1 | 0.00 | 4.76 | | | | | | |
| **R1/F04** | W3/F04 | Unknown-Resi | | 135 | 16 | 57 | 16 | 57 | 0 | 0 | 0.00 | 0.00 | | | | | | |
| **R1/F04** | W4/F04 | Unknown-Resi | | 135 | 7 | 35 | 7 | 35 | 0 | 0 | 0.00 | 0.00 | 21 | 81 | 21 | 80 | 0.0 | 1 |
| **36 Endell Street-Dudley Court** | | | | | | | | | | | | | | | | | | |
| **R1/F01** | W1/F01 | Unknown-Resi | | 138 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 | 0.00 | 0 | 0 | 0 | 0 | 0.0 | 0 |
| **R2/F01** | W2/F01 | Unknown-Resi | | -132 | 4 | 8 | 4 | 8 | 0 | 0 | 0.00 | 0.00 | | | | | | |
| **R2/F01** | W3/F01 | Unknown-Resi | | -132 | 6 | 11 | 6 | 11 | 0 | 0 | 0.00 | 0.00 | | | | | | |
| **R2/F01** | W4/F01 | Unknown-Resi | | 138 | 11 | 54 | 11 | 42 | 0 | 12 | 0.00 | 22.22 | | | | | | |
| **R2/F01** | W5/F01 | Unknown-Resi | | 48 | 1 | 19 | 0 | 13 | 1 | 6 | 100.00 | 31.58 | 13 | 57 | 12 | 51 | 7.7 | 11 |
| **R1/F02** | W1/F02 | Unknown-Resi | | 138 | 1 | 1 | 1 | 1 | 0 | 0 | 0.00 | 0.00 | 1 | 1 | 1 | 1 | 0.0 | 0 |
| **R2/F02** | W2/F02 | Unknown-Resi | | -132 | 6 | 10 | 6 | 10 | 0 | 0 | 0.00 | 0.00 | | | | | | |
| **R2/F02** | W3/F02 | Unknown-Resi | | -132 | 8 | 13 | 8 | 13 | 0 | 0 | 0.00 | 0.00 | | | | | | |
| **R2/F02** | W4/F02 | Unknown-Resi | | 138 | 14 | 60 | 13 | 51 | 1 | 9 | 7.14 | 15.00 | | | | | | |
| **R2/F02** | W5/F02 | Unknown-Resi | | 48 | 2 | 22 | 0 | 16 | 2 | 6 | 100.00 | 27.27 | 16 | 63 | 14 | 56 | 12.5 | 11 |
| **R1/F03** | W1/F03 | Unknown-Resi | | 138 | 4 | 4 | 3 | 3 | 1 | 1 | 25.00 | 25.00 | 4 | 4 | 3 | 3 | 25.0 | 25 |
| **R2/F03** | W2/F03 | Unknown-Resi | | -132 | 12 | 16 | 12 | 16 | 0 | 0 | 0.00 | 0.00 | | | | | | |
| **R2/F03** | W3/F03 | Unknown-Resi | | -132 | 12 | 17 | 12 | 17 | 0 | 0 | 0.00 | 0.00 | | | | | | |
| **R2/F03** | W4/F03 | Unknown-Resi | | 138 | 22 | 70 | 20 | 64 | 2 | 6 | 9.09 | 8.57 | | | | | | |
| **R2/F03** | W5/F03 | Unknown-Resi | | 48 | 2 | 24 | 1 | 21 | 1 | 3 | 50.00 | 12.50 | 23 | 72 | 22 | 68 | 4.3 | 6 |
| **R1/F04** | W1/F04 | Unknown-Resi | | 138 | 6 | 7 | 3 | 3 | 3 | 4 | 50.00 | 57.14 | 6 | 7 | 3 | 3 | 50.0 | 57 |
| **R2/F04** | W2/F04 | Unknown-Resi | | -132 | 14 | 18 | 14 | 18 | 0 | 0 | 0.00 | 0.00 | | | | | | |
| **R2/F04** | W3/F04 | Unknown-Resi | | -132 | 15 | 20 | 15 | 20 | 0 | 0 | 0.00 | 0.00 | | | | | | |
| **R2/F04** | W4/F04 | Unknown-Resi | | 138 | 25 | 75 | 24 | 71 | 1 | 4 | 4.00 | 5.33 | | | | | | |
| **R2/F04** | W5/F04 | Unknown-Resi | | 48 | 3 | 26 | 2 | 24 | 1 | 2 | 33.33 | 7.69 | 25 | 75 | 24 | 72 | 4.0 | 4 |
| **175 Drury Lane** | | | | | | | | | | | | | | | | | | |
| **R1/F03** | W1/F03 | Unknown-Resi | | -132 | 21 | 61 | 20 | 60 | 1 | 1 | 4.76 | 1.64 | | | | | | |
| **R1/F03** | W2/F03 | Unknown-Resi | | -132 | 21 | 61 | 20 | 60 | 1 | 1 | 4.76 | 1.64 | | | | | | |
| **R1/F03** | W3/F03 | Unknown-Resi | | 135 | 21 | 53 | 21 | 53 | 0 | 0 | 0.00 | 0.00 | 23 | 69 | 23 | 69 | 0.0 | 0 |
| **176 Drury Lane** | | | | | | | | | | | | | | | | | | |
| **R1/F03** | W1/F03 | Unknown-Resi | | -132 | 21 | 60 | 20 | 59 | 1 | 1 | 4.76 | 1.67 | | | | | | |
| **R1/F03** | W2/F03 | Unknown-Resi | | -132 | 21 | 61 | 20 | 60 | 1 | 1 | 4.76 | 1.64 | 21 | 61 | 20 | 60 | 4.8 | 2 |
| **177-179 Drury Lane** | | | | | | | | | | | | | | | | | | |
| **R1/F03** | W1/F03 | Unknown-Resi | | -131 | 23 | 60 | 20 | 57 | 3 | 3 | 13.04 | 5.00 | | | | | | |
| **R1/F03** | W2/F03 | Unknown-Resi | | -131 | 22 | 58 | 19 | 55 | 3 | 3 | 13.64 | 5.17 | 23 | 60 | 20 | 57 | 13.0 | 5 |

# Appendix 04

*Window Map*