



DAYLIGHT & SUNLIGHT

IMPACT ON NEIGHBOURING
PROPERTIES

39 Deansgate, Manchester

28 November 2019

GIA No: **0368**

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Principles of Daylight and Sunlight
Existing Drawings 0368-REL01-IS01-01 to 0368-REL01-IS01-03
Proposed Drawings: 0368-REL01-IS01-04 to 0368-REL01-IS01-06
Surrounding Results & Window Maps

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1.0 Executive Summary

We have undertaken a daylight and sunlight assessment for the proposed development known as 39 Deansgate, Manchester.

We have undertaken a technical analysis using 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 BRE 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.

One residential property surrounding the site, No. 1 Deansgate, is residential use and has been considered in our assessment. The results for this property are summarised in the table below:

Name/Address of Building	Percentage of Rooms Compliant for VSC Daylight	Percentage of Rooms Compliant for NSL Daylight	Percentage of Rooms Compliant for APSH Sunlight
No. 1 Deansgate	34/39 (87%)	39/39 (100%)	39/39 (100%)

No. 1 Deansgate will remain fully compliant in terms of NSL daylight and APSH sunlight with the proposed development in place.

The five rooms which do not meet the criteria for VSC daylight fall marginally short of the target reduction of 20%, and none are reduced by more than 25%. These rooms are dual aspect living kitchen dining rooms, with one room on each floor between the fourth floor and eighth floor falling marginally short of the BRE targets. These rooms will still achieve a good VSC level for a city centre and are only just outside the 20% reduction that the BRE states as being noticeable, with reductions between 21.4% and 24.8%.

We have obtained detailed floor plans of No.1 Deansgate, and so we have also undertaken supplementary ADF tests.

The five living kitchen diners that fall short of the VSC targets will achieve ADF levels of between 7.2% and 8.4%. These are all well in excess of the 2% ADF target. All rooms within No.1 Deansgate will comply with the ADF targets.

The proposed development will be very similar in height to No. 1 Deansgate. In order for the proposed development to match the scale and mass of the existing residential buildings, deviations on the published BRE targets are expected. This is anticipated in the BRE Guide, where it recognises that the levels of daylight and sunlight will be different in these locations to low rise, sub-urban development. It would be unrealistic for the surrounding residential properties to expect to maintain similar levels of daylight and sunlight as those currently enjoyed if the proposed development is to match their height and mass.

Furthermore, the density required to make efficient use of the site, means that achieving the published BRE targets (better suited to low-rise suburban development) would be an unrealistic expectation.

The compliance levels for VSC and NSL daylight and APSH sunlight are considered very good and exceed our expectations for a city centre location. The ADF analysis indicates that all rooms within No.1 Deansgate will continue to significantly exceed their respective targets.

Overall, we consider the results to No.1 Deansgate to be acceptable.

2.0 Instructions

GIA have been instructed by Kames Property Income Fund to undertake a detailed technical assessment to understand the potential daylight and sunlight changes that the proposed development known as 39 Deansgate, Manchester will have upon the surrounding residential properties.

The daylight and sunlight review within this report considers existing and consented residential properties only, as they are recognised by the Building Research Establishment (BRE 2011) as having the highest expectation for natural light when compared to other uses – such as commercial. The criteria suggested within the BRE have been used to understand and compare the existing levels of light, and the light achieved subsequent to the development of the proposed scheme.

The conclusions in the report also consider the National Design Guidance, October 2019, paragraph 70, which states that, *“proposals for tall buildings (and other buildings with a significantly larger scale or bulk than their surroundings) require special consideration. This includes their location and siting; relationship to context; impact on local character, views and sight lines; composition – how they meet the ground and the sky; and environmental impacts, such as sunlight, daylight, overshadowing and wind. These need to be resolved satisfactorily in relation to the context and local character.”*

3.0 Introduction

Daylight and Sunlight

We have undertaken technical analysis using 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 "BRE Guide").

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 Guide provides three methodologies for daylight assessment, namely:

- The Vertical Sky Component (VSC);
- The No Sky Line (NSL); and
- The Average Daylight Factor (ADF).

There is one methodology 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

FIND Maps

OS Map

Vertex Modelling

IR06-20190325

Sheppard Robson Architects

IR09-20191023

Manchester Planning Portal

No. 1 Deansgate floor plans

5.0 Assumptions

- a) All residential buildings have been identified by reference to the Valuation Office Agency (VOA) search and/or external observation.
- b) We have not sought access to the adjoining properties, thus if plans were not publicly available, we have made reasonable assumptions as to the internal layouts of the rooms behind the fenestration based upon the building form and architecture. This is normal practice where access to adjoining properties is not available. Unless the building form dictates otherwise, we assume a standard 4.2m deep room (14ft) for residential properties.
- c) Floor levels have been assumed for the adjoining properties. This dictates the level of the working plane which is relevant for the No Skyline assessment.

6.0 The Site

The site is bound by St Mary's Gate to the north, Exchange Street/St Ann's Square to the east, Barton Arcade/Barton Square to the south and Deansgate to the west.

The drawing extract below shows the site:

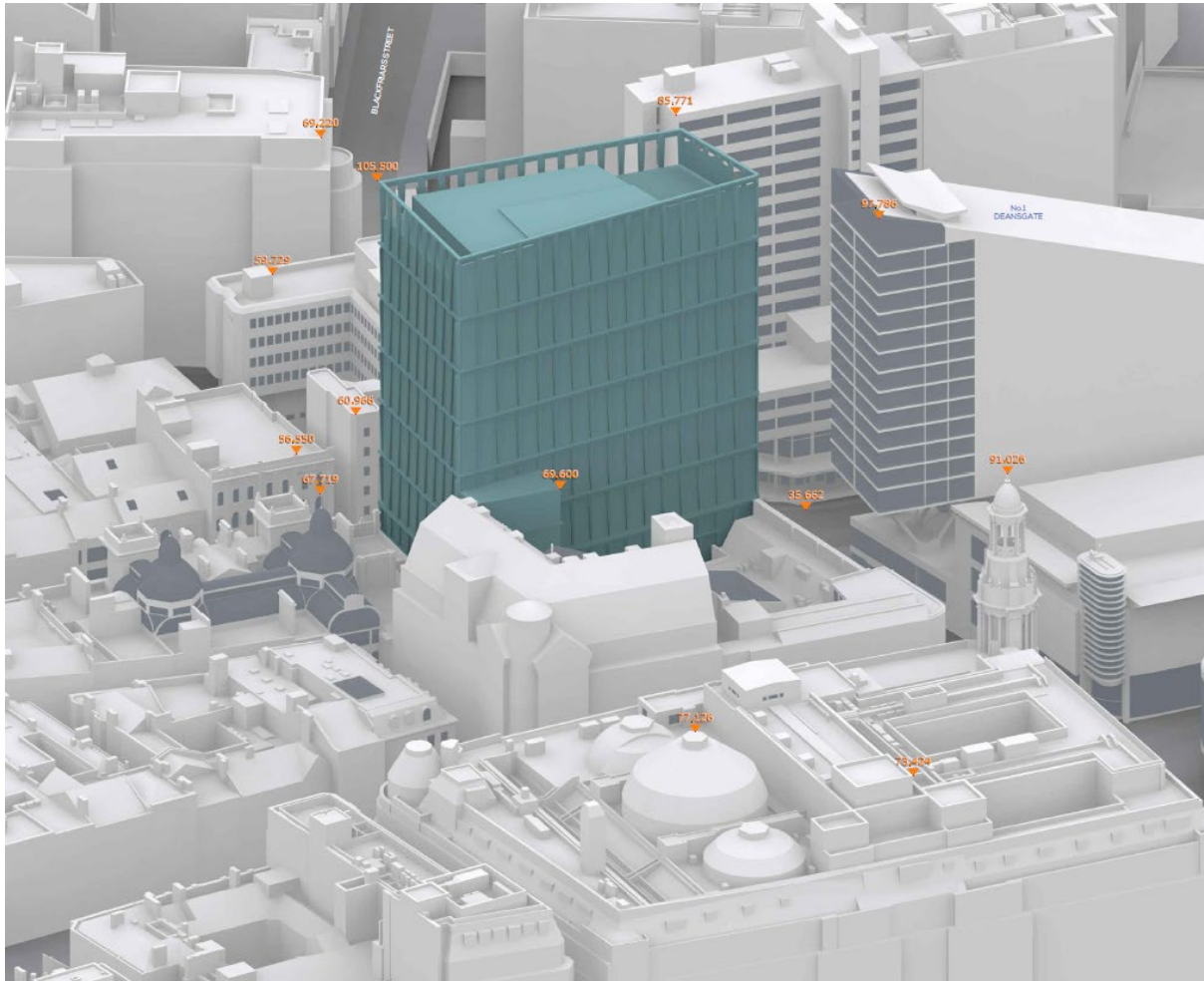


Our understanding of this existing building and the surrounding context is depicted on GIA drawings 0368-REL01-IS01-01, 0368-REL01-IS01-02 and 0368-REL01-IS01-03 within Appendix 02.

7.0 The Proposal

GIA's understanding of the proposed scheme is illustrated in drawings 0368-REL01-IS01-04, 0368-REL01-IS01-05 and 0368-REL01-IS01-06 shown within Appendix 03.

Our analysis of this option is based on the proposed scheme drawings produced by Sheppard Robson Architects received on 23 October 2019.



8.0 Surrounding Properties

We have created a three-dimensional computer model of the site and the surrounding properties to allow for a detailed daylight and sunlight assessment.

The benchmark condition of the site allows us to calculate the daylight and sunlight conditions within the neighbouring buildings. From this, we can then compare them with the conditions within these properties assuming the current proposed development is in place.

It is well-established and accepted that the BRE Guidelines, which set out the numerical benchmark for daylight and sunlight assessments, are predicated on a relatively low-rise suburban environment. The methodologies and the resultant BRE daylight and sunlight recommendations are also predicated upon this suburban model. The guidance provided by the BRE is not mandatory and it is principally proposed to aid the architects and planners in achieving good site design. Clearly, in more densely developed urban locations and urban areas such as this site, the technical specifications recommended by the BRE Guidelines need to be treated with care.

We understand that there is a flat located at the top of Barton Arcade however the main windows in this property face east/west, and therefore not towards the development. The roof top amenity area associated with the flat is also located to the south of the development, and as such, there is no potential for overshadowing impact.

Those residential properties surrounding the site that are thought to have the potential to be impacted by the proposed development are listed in the table below:

Name/Address of Building	Assumed Use	Position (in relation to the Development)
No. 1 Deansgate	Residential	North

A short commentary of the impacts of the current proposal to each property is listed below, and full results and contour plots are contained at Appendix 04:

No. 1 Deansgate



Name/Address of Building	Percentage of Room Compliant for VSC Daylight	Percentage of Rooms Compliant for NSL Daylight	Percentage of Rooms Compliant for APSH Sunlight
No. 1 Deansgate	34/39 (87%)	39/39 (100%)	39/39 (100%)

No. 1 Deansgate will remain fully compliant in terms of NSL daylight and APSH sunlight with the proposed development in place.

The five rooms which do not meet the criteria for VSC daylight fall marginally short of the target reduction of 20%, and none are reduced by more than 25%. These rooms are dual aspect living kitchen dining rooms, with one room on each floor between the fourth floor and eighth floor falling marginally short of the BRE targets. These rooms will still achieve a good VSC level for a city centre, and are only just outside the 20% reduction that the BRE states as being noticeable, with reductions between 21.4% and 24.8%.

We have obtained detailed floor plans of No.1 Deansgate, and so we have also undertaken supplementary ADF tests. 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 assessment has been used to better understand the daylight impacts.

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 more than one use, the higher target should be used. For the living kitchen diners in No. 1 Deansgate, we have considered compliance against the 2% ADF targets for kitchens.

The five living kitchen diners that fall short of the VSC targets will achieve ADF levels of between 7.2% and 8.4%. These are all well in excess of the 2% ADF target. All rooms within No.1 Deansgate will comply with the ADF targets.

The compliance levels for VSC and NSL daylight and APSH sunlight are considered very good and commensurate with our expectations for a city centre location.

9.0 Conclusions

We have undertaken a daylight and sunlight assessment for the proposed development at 39 Deansgate, Manchester.

The proposed development will be very similar in height to the existing residential building, No. 1 Deansgate. In order for the proposed development to match the scale and mass of the existing residential buildings, deviations on the BRE targets are inevitable. The density required to make efficient use of the site, and to match that of the existing surrounding residential buildings, means that the published BRE targets (better suited to low-rise suburban development) would be very difficult to achieve.

In our overall opinion, the daylight and sunlight impact of the proposed development is acceptable.

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 in 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 out 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 and 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".

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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 existing surrounding properties.

Each method is described below:

Vertical Sky Component

Methodology

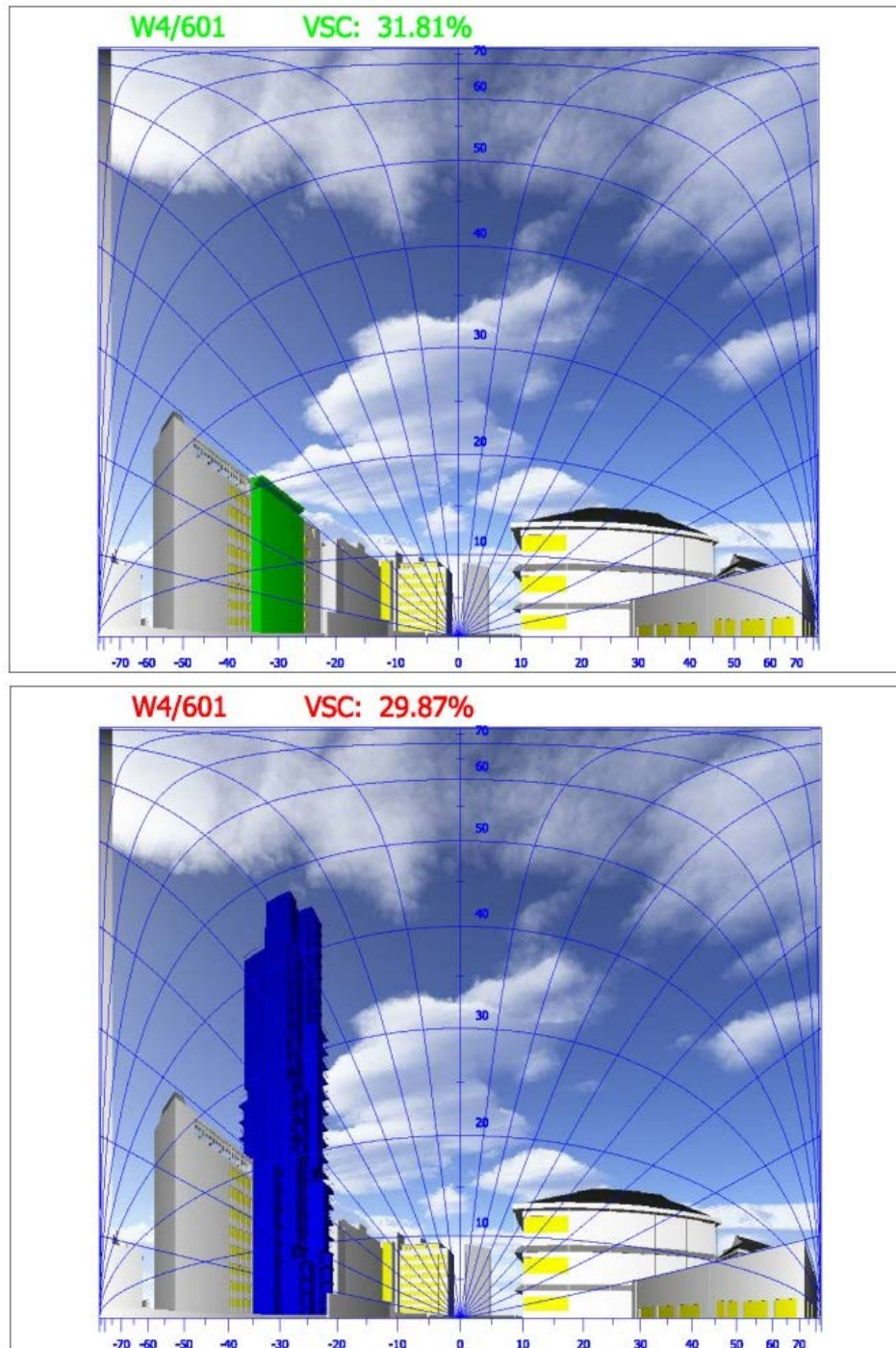
This is defined in the BRE as:-

"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 illuminate 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.

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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.

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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 provide 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.

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(c) Adjoining Development Land

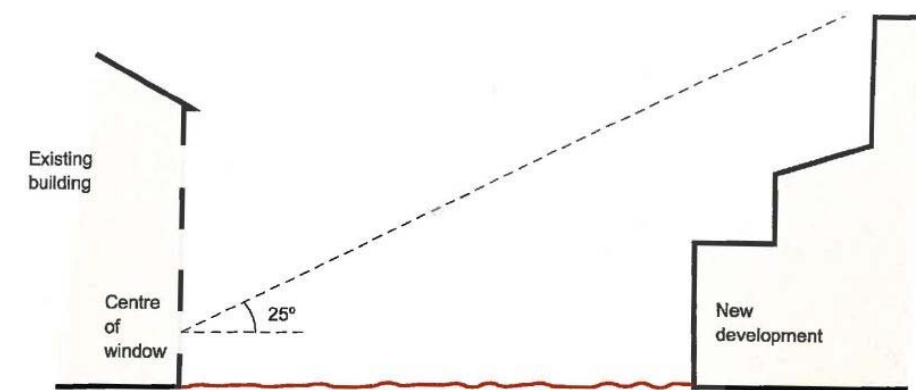
Paragraph 2.3.10 of the BRE guidelines states:

"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 16m 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 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.

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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."*

Principles of Daylight and Sunlight

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"; and*
- *"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

Principles of Daylight and Sunlight

- 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 sun's 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 2 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 2 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 sun set 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.

Principles of Daylight and Sunlight

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 of 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.

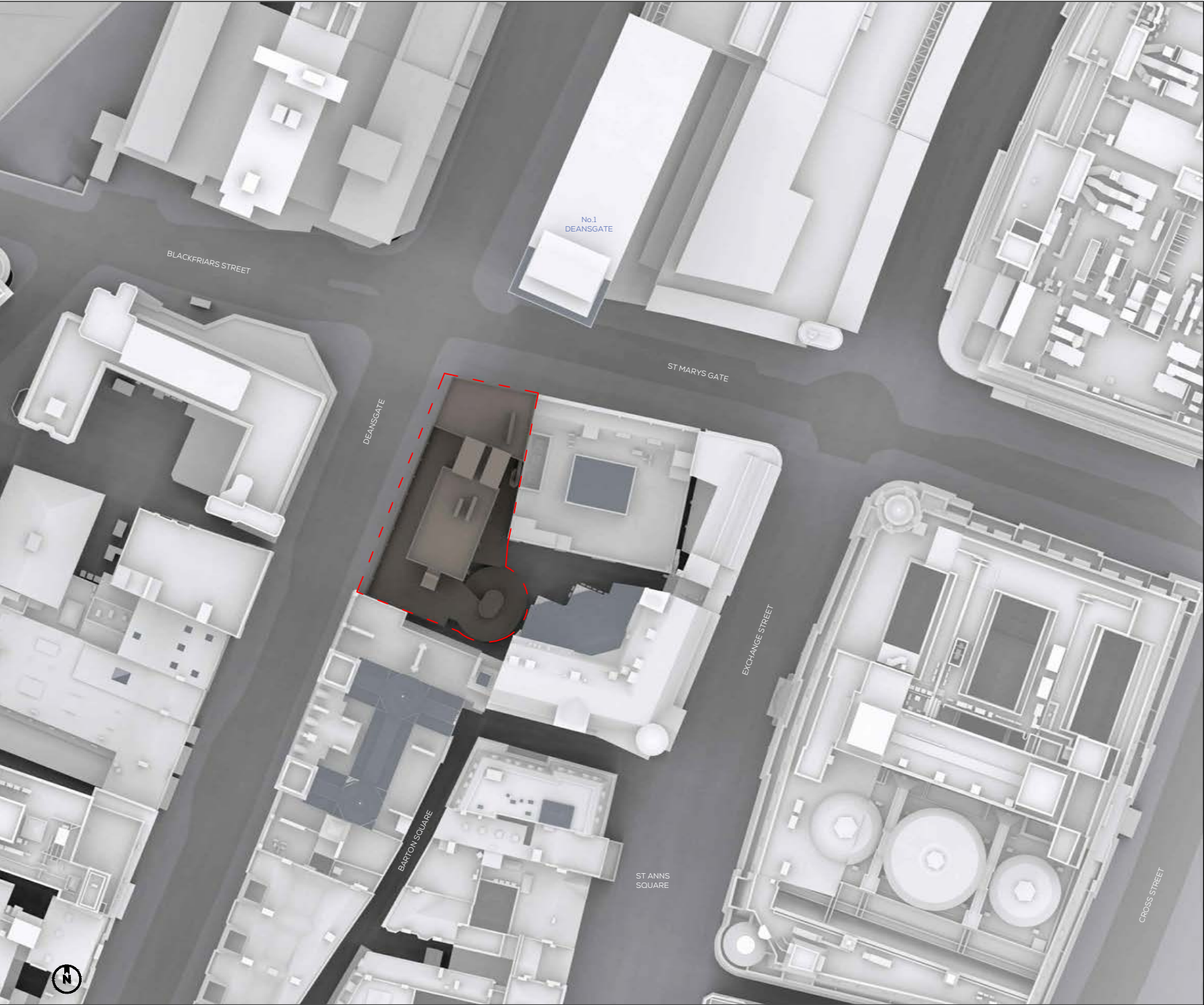
Other Amenity Considerations

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

Existing Drawings



SOURCES OF INFORMATION

IR02-20190225-SR
IR03-20190320-MSA SURVEY
IR04-LAND REGISTRY
IR06-20190325-VERTEX

ALL INFORMATION DISPLAYED IS SUBJECT TO A COMPLETE VERIFIABLE SITE SURVEY BEING UNDERTAKEN; GIA TAKES NO RESPONSIBILITY ON THE ACCURACY OR RELIABILITY OF THE DISPLAYED DATA SINCE A VERIFIED SITE SURVEY WAS NOT MADE AVAILABLE PRIOR TO THE GENERATION OF SUCH INFORMATION.

--- SITE BOUNDARY

NOTES:
EXISTING SCENARIO SHOWN IN SEPIA

N.B. DO NOT SCALE OFF THIS DRAWING

PROJECT:
39 DEANSGATE,
MANCHESTER.

DRAWING NAME:
PLAN VIEW EXISTING
EXISTING v PROPOSED

DWN BY	SCALE	CHK BY	STATUS	DATE
NB	NTS	SP	-	MAY 2019
PROJ No.	REL No.	IS No.	DWG No.	REV No.
0368	01	01	01	-

2 Commercial St.
Manchester
M15 4RQ
t 0161 672 5101
mail@gia.uk.com
www.gia.uk.com

MANCHESTER • LONDON



SOURCES OF INFORMATION

IR02-20190225-SR
IR03-20190320-MSA SURVEY
IR04-LAND REGISTRY
IR06-20190325-VERTEX

ALL INFORMATION DISPLAYED IS SUBJECT TO A COMPLETE VERIFIABLE SITE SURVEY BEING UNDERTAKEN. GIA TAKES NO RESPONSIBILITY ON THE ACCURACY OR RELIABILITY OF THE DISPLAYED DATA SINCE A VERIFIED SITE SURVEY WAS NOT MADE AVAILABLE PRIOR TO THE GENERATION OF SUCH INFORMATION.

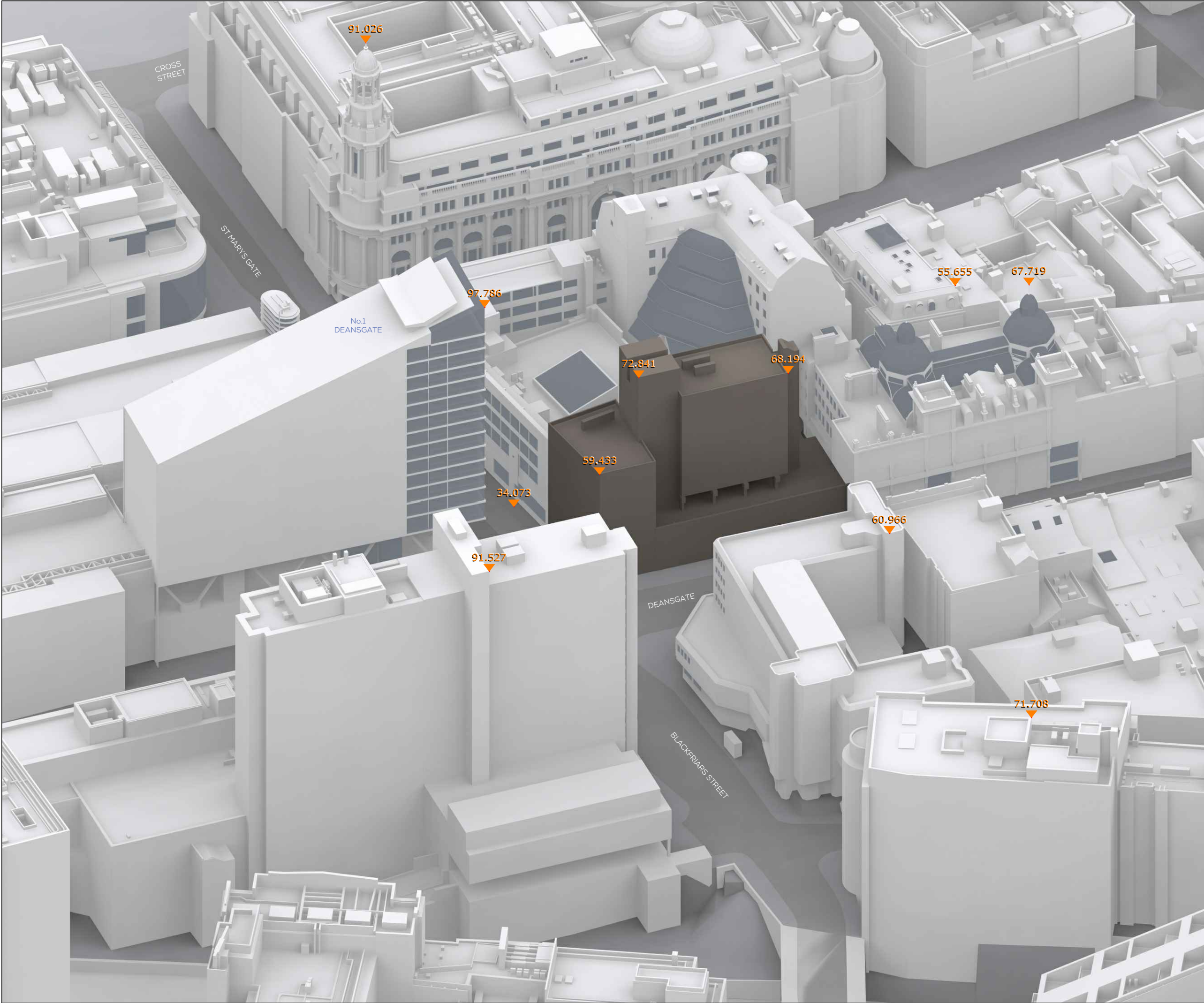
NOTES:
EXISTING SCENARIO SHOWN IN SEPIA

N.B. DO NOT SCALE OFF THIS DRAWING

PROJECT:
39 DEANSGATE,
MANCHESTER.

DRAWING NAME:
3D VIEW EXISTING
EXISTING v PROPOSED

DWN BY	SCALE	CHK BY	STATUS	DATE
NB	NTS	SP	-	MAY 2019
PROJ No.	REL No.	IS No.	DWG No.	REV No.
0368	01	01	02	-



SOURCES OF INFORMATION

IR02-20190225-SR
IR03-20190320-MSA SURVEY
IR04-LAND REGISTRY
IR06-20190325-VERTEX

ALL INFORMATION DISPLAYED IS SUBJECT TO A COMPLETE VERIFIABLE SITE SURVEY BEING UNDERTAKEN. GIA TAKES NO RESPONSIBILITY ON THE ACCURACY OR RELIABILITY OF THE DISPLAYED DATA SINCE A VERIFIED SITE SURVEY WAS NOT MADE AVAILABLE PRIOR TO THE GENERATION OF SUCH INFORMATION.

NOTES:
EXISTING SCENARIO SHOWN IN SEPIA

N.B. DO NOT SCALE OFF THIS DRAWING

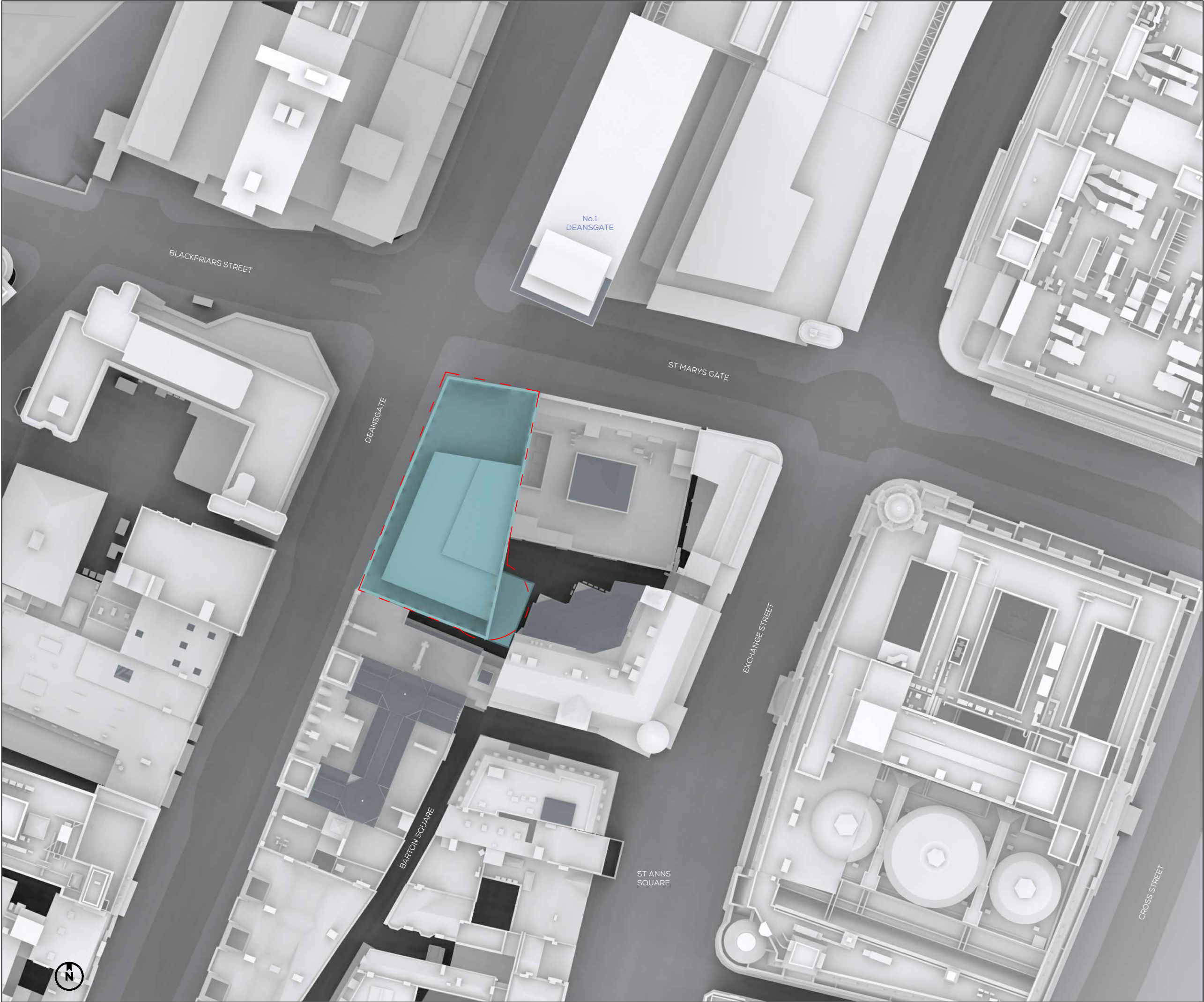
PROJECT:
39 DEANSGATE,
MANCHESTER.

DRAWING NAME:
3D VIEW EXISTING
EXISTING v PROPOSED

DWN BY	SCALE	CHK BY	STATUS	DATE
NB	NTS	SP	-	MAY 2019
PROJ No.	REL No.	IS No.	DWG No.	REV No.
0368	01	01	03	-

Appendix 03

Proposed Drawings



SOURCES OF INFORMATION

IR02-20190225-SR
IR03-20190320-MSA SURVEY
IR04-LAND REGISTRY
IR06-20190325-VERTEX
IR07-20191023-SR

ALL INFORMATION DISPLAYED IS SUBJECT TO A COMPLETE VERIFIABLE SITE SURVEY BEING UNDERTAKEN. GIA TAKES NO RESPONSIBILITY ON THE ACCURACY OR RELIABILITY OF THE DISPLAYED DATA SINCE A VERIFIED SITE SURVEY WAS NOT MADE AVAILABLE PRIOR TO THE GENERATION OF SUCH INFORMATION.

— — — SITE BOUNDARY

NOTES:
PROPOSED SCHEME SHOWN IN TEAL

N.B. DO NOT SCALE OFF THIS DRAWING

PROJECT:
39 DEANSGATE,
MANCHESTER.

DRAWING NAME:
PLAN VIEW PROPOSED
EXISTING v PROPOSED

DWN BY	SCALE	CHK BY	STATUS	DATE
SP	NTS	SP	-	NOV19
PROJ No.	REL No.	IS No.	DWG No.	REV No.
0368	02	01	04	-



SOURCES OF INFORMATION

IR02-20190225-SR
IR03-20190320-MSA SURVEY
IR04-LAND REGISTRY
IR06-20190325-VERTEX
IR07-20191023-SR

ALL INFORMATION DISPLAYED IS SUBJECT TO A COMPLETE VERIFIABLE SITE SURVEY BEING UNDERTAKEN. GIA TAKES NO RESPONSIBILITY ON THE ACCURACY OR RELIABILITY OF THE DISPLAYED DATA SINCE A VERIFIED SITE SURVEY WAS NOT MADE AVAILABLE PRIOR TO THE GENERATION OF SUCH INFORMATION.

NOTES:
PROPOSED SCHEME SHOWN IN TEAL

N.B. DO NOT SCALE OFF THIS DRAWING

PROJECT:
39 DEANSGATE,
MANCHESTER.

DRAWING NAME:
3D VIEW PROPOSED
EXISTING v PROPOSED

DWN BY	SCALE	CHK BY	STATUS	DATE
SP	NTS	SP	-	NOV19
PROJ No.	REL No.	IS No.	DWG No.	REV No.
0368	02	01	05	-



SOURCES OF INFORMATION

IR02-20190225-SR
IR03-20190320-MSA SURVEY
IR04-LAND REGISTRY
IR06-20190325-VERTEX
IR07-20191023-SR

ALL INFORMATION DISPLAYED IS SUBJECT TO A COMPLETE VERIFIABLE SITE SURVEY BEING UNDERTAKEN. GIA TAKES NO RESPONSIBILITY ON THE ACCURACY OR RELIABILITY OF THE DISPLAYED DATA SINCE A VERIFIED SITE SURVEY WAS NOT MADE AVAILABLE PRIOR TO THE GENERATION OF SUCH INFORMATION.

NOTES:
PROPOSED SCHEME SHOWN IN TEAL

N.B. DO NOT SCALE OFF THIS DRAWING

PROJECT:
39 DEANS GATE,
MANCHESTER.

DRAWING NAME:
3D VIEW PROPOSED
EXISTING v PROPOSED

DWN BY	SCALE	CHK BY	STATUS	DATE
SP	NTS	SP	-	NOV19
PROJ No.	REL No.	IS No.	DWG No.	REV No.
0368	02	01	06	-

Appendix 04

Surrounding Results & Window Maps

					VSC (ROOM)					NSL					APSH (WINDOW)				
FLOOR	ROOM	PROPERTY	ROOM	WINDOW	EX	PR	LOSS	LOSS	MEETS	EX	PR	LOSS	LOSS	MEETS	EX		PR		LOS
		TYPE	USE		%	%		%	CRITERIA	%	%	SQM	%	CRITERIA	ANNUAL	WINTER	ANNUAL	WINTER	ANNUAL
NO.1 DEANSGATE																			
F04	R1	RESIDENTIAL	BEDROOM	W1/F04	26.9	26.7	0.2	0.7%	YES	85.1	85.1	0.0	0.0%	YES					
	R2	RESIDENTIAL	LKD	W2/F04	29.4	23.1	6.3	21.4%	NO	99.5	98.1	0.7	14%	YES					
			LKD	W3/F04															
	R3	RESIDENTIAL	LKD	W4/F04	32.1	26.2	5.9	18.4%	YES	99.4	96.6	1.5	2.8%	YES					
			LKD	W5/F04															
F05	R1	RESIDENTIAL	BEDROOM	W1/F05	28.2	28	0.2	0.7%	YES	80.5	80.5	0.0	0.0%	YES					
	R2	RESIDENTIAL	LKD	W2/F05	31.4	24	7.4	23.6%	NO	99.5	97.9	0.8	15%	YES					
			LKD	W3/F05															
	R3	RESIDENTIAL	LKD	W4/F05	34.5	27.7	6.8	19.7%	YES	99.4	96.6	1.5	2.9%	YES					
			LKD	W5/F05															
F06	R1	RESIDENTIAL	BEDROOM	W1/F06	29.4	29.1	0.3	1.0%	YES	82.7	82.7	0.0	0.0%	YES					
	R2	RESIDENTIAL	LKD	W2/F06	32.7	24.8	7.9	24.2%	NO	99.5	98.1	0.7	14%	YES					
			LKD	W3/F06															
	R3	RESIDENTIAL	LKD	W4/F06	35.8	28.6	7.2	20.1%	YES	99.4	96.6	1.5	2.8%	YES					
			LKD	W5/F06															
F07	R1	RESIDENTIAL	BEDROOM	W1/F07	30.5	30.3	0.2	0.7%	YES	85.9	85.9	0.0	0.0%	YES					
	R2	RESIDENTIAL	LKD	W2/F07	33.9	25.7	8.2	24.2%	NO	99.5	98	0.7	14%	YES					
			LKD	W3/F07															
	R3	RESIDENTIAL	LKD	W4/F07	36.9	29.4	7.5	20.3%	YES	99.4	96.6	1.5	2.8%	YES					
			LKD	W5/F07															
F08	R1	RESIDENTIAL	BEDROOM	W1/F08	31.7	31.5	0.2	0.6%	YES	90.8	90.8	0.0	0.0%	YES					
	R2	RESIDENTIAL	LKD	W2/F08	35.1	26.4	8.7	24.8%	NO	99.5	98	0.7	14%	YES					
			LKD	W3/F08															
	R3	RESIDENTIAL	LKD	W4/F08	37.8	30.2	7.6	20.1%	YES	99.4	96.6	1.5	2.8%	YES					
			LKD	W5/F08															
F09	R1	RESIDENTIAL	BEDROOM	W1/F09	32.9	32.7	0.2	0.6%	YES	98.9	98.9	0.0	0.0%	YES					
	R2	RESIDENTIAL	LKD	W2/F09	36.2	27.3	8.9	24.6%	YES	99.5	98.1	0.7	14%	YES					
			LKD	W3/F09															
	R3	RESIDENTIAL	LKD	W4/F09	38.6	30.9	7.7	19.9%	YES	99.4	96.6	1.5	2.8%	YES					
			LKD	W5/F09															
F10	R1	RESIDENTIAL	BEDROOM	W1/F10	34	33.8	0.2	0.6%	YES	100	100	0.0	0.0%	YES					

(1) KITCHEN SMALLER THAN 13m2

(2) INC\HZ = SKY COMPONENT (INCLINED\HORIZONTAL WINDOWS)

(3) SINGLE ASPECT ROOM DEEPER THAN 5m

					VSC (ROOM)					NSL					APSH (WINDOW)				
FLOOR	ROOM	PROPERTY TYPE	ROOM USE	WINDOW	EX	PR	LOSS	LOSS	MEETS	EX	PR	LOSS	LOSS	MEETS	EX		PR		LOSS
					%	%		%	CRITERIA	%	%	SQM	%	CRITERIA	ANNUAL	WINTER	ANNUAL	WINTER	ANNUAL
NO.1 DEANSGATE (CONTINUED)																			
	R2	RESIDENTIAL	LKD	W2/F10	37.1	28.1	9	24.3%	YES	99.5	98.1	0.7	14%	YES					
			LKD	W3/F10															
	R3	RESIDENTIAL	LKD	W4/F10	39.3	31.4	7.9	20.1%	YES	99.4	96.6	15	2.8%	YES					
			LKD	W5/F10															
F11	R1	RESIDENTIAL	BEDROOM	W1/F11	35.2	35	0.2	0.6%	YES	100	100	0.0	0.0%	YES					
	R2	RESIDENTIAL	LKD	W2/F11	37.7	28.9	8.8	23.3%	YES	99.5	98.1	0.7	14%	YES					
			LKD	W3/F11															
	R3	RESIDENTIAL	LKD	W4/F11	39.4	31.8	7.6	19.3%	YES	99.4	96.6	15	2.8%	YES					
			LKD	W5/F11															
F12	R1	RESIDENTIAL	BEDROOM	W1/F12	36.2	36.1	0.1	0.3%	YES	100	100	0.0	0.0%	YES					
	R2	RESIDENTIAL	LKD	W2/F12	38.2	29.6	8.6	22.5%	YES	99.5	98.1	0.7	14%	YES					
			LKD	W3/F12															
	R3	RESIDENTIAL	LKD	W4/F12	39.5	32.1	7.4	18.7%	YES	99.4	96.6	15	2.8%	YES					
			LKD	W5/F12															
F13	R1	RESIDENTIAL	BEDROOM	W1/F13	37.3	37.1	0.2	0.5%	YES	100	100	0.0	0.0%	YES					
	R2	RESIDENTIAL	LKD	W2/F13	38.6	30.5	8.1	21.0%	YES	99.5	98.1	0.7	14%	YES					
			LKD	W3/F13															
	R3	RESIDENTIAL	LKD	W4/F13	39.5	32.6	6.9	17.5%	YES	99.4	96.6	15	2.8%	YES					
			LKD	W5/F13															
F14	R1	RESIDENTIAL	BEDROOM	W1/F14	38.2	38.1	0.1	0.3%	YES	100	100	0.0	0.0%	YES					
	R2	RESIDENTIAL	LKD	W2/F14	39	31.4	7.6	19.5%	YES	99.5	98.1	0.7	14%	YES					
			LKD	W3/F14															
	R3	RESIDENTIAL	LKD	W4/F14	39.6	33.1	6.5	16.4%	YES	99.4	96.6	15	2.8%	YES					
			LKD	W5/F14															
F15	R1	RESIDENTIAL	BEDROOM	W1/F15	38.9	38.8	0.1	0.3%	YES	100	100	0.0	0.0%	YES					
	R2	RESIDENTIAL	LKD	W2/F15	39.3	32.4	6.9	17.6%	YES	99.5	98.1	0.7	14%	YES					
			LKD	W3/F15															
	R3	RESIDENTIAL	LKD	W4/F15	39.6	33.8	5.8	14.6%	YES	99.4	96.6	15	2.8%	YES					
			LKD	W5/F15															
F16	R1	RESIDENTIAL	BEDROOM	W1/F16	39.2	39.1	0.1	0.3%	YES	100	100	0.0	0.0%	YES					
	R2	RESIDENTIAL	LKD	W2/F16	39.4	33.4	6	15.2%	YES	99.5	98	0.7	14%	YES					

(1) KITCHEN SMALLER THAN 13m²

(2) INC\HZ = SKY COMPONENT (INCLINED\HORIZONTAL WINDOWS)

(3) SINGLE ASPECT ROOM DEEPER THAN 5m

					VSC (ROOM)					NSL					APSH (WINDOW)				
FLOOR	ROOM	PROPERTY TYPE	ROOM USE	WINDOW	EX.	PR.	LOSS	LOSS	MEETS	EX.	PR.	LOSS	LOSS	MEETS	EX.		PR.		LOS
					%	%		%	CRITERIA	%	%	SQM	%	CRITERIA	ANNUAL	WINTER	ANNUAL	WINTER	ANNUAL
NO.1 DEANS GATE (CONTINUED)																			
			LKD	W3/F16															
	R3	RESIDENTIAL	LKD	W4/F16	39.6	34.6	5	12.6%	YES	99.4	96.9	13	2.6%	YES					
			LKD	W5/F16															







(1) KITCHEN SMALLER THAN 13m²
(2) INC\HZ = SKY COMPONENT (INCLINED\HORIZONTAL WINDOWS)
(3) SINGLE ASPECT ROOM DEEPER THAN 5m

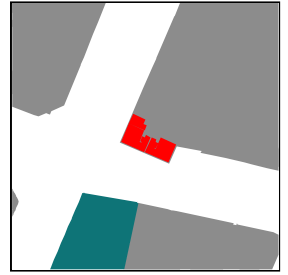
NSL CONTOURS



PROJECT: 0368 - 39 DEANS GATE, MANCHESTER
REPORT TITLE: EXISTING VS. PROPOSED
ADDRESS: NO.1 DEANS GATE
DATE: 25/11/2019
SCHEME IR: IR07
DRAWING No.: 0368-REL02-IS01-DD1

KEY:

- GAIN
- LOSS
- MAINTAINED LIT AREA
- 1 METRE GRID



F04



F04



F05



F05

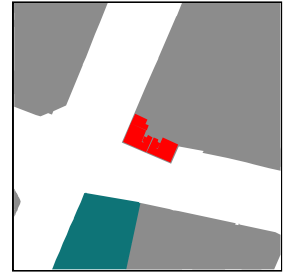
NSL CONTOURS



PROJECT: 0368 - 39 DEANS GATE, MANCHESTER
 REPORT TITLE: EXISTING VS. PROPOSED
 ADDRESS: NO.1 DEANS GATE
 DATE: 25/11/2019
 SCHEME IR: IR07
 DRAWING No.: 0368-REL02-IS01-DD2

KEY:

- GAIN
- LOSS
- MAINTAINED LIT AREA
- 1 METRE GRID



NSL CONTOURS



PROJECT: 0368 - 39 DEANS GATE, MANCHESTER
REPORT TITLE: EXISTING VS. PROPOSED
ADDRESS: NO.1 DEANS GATE
DATE: 25/11/2019
SCHEME IR: IR07
DRAWING No.: 0368-REL02-IS01-DD3

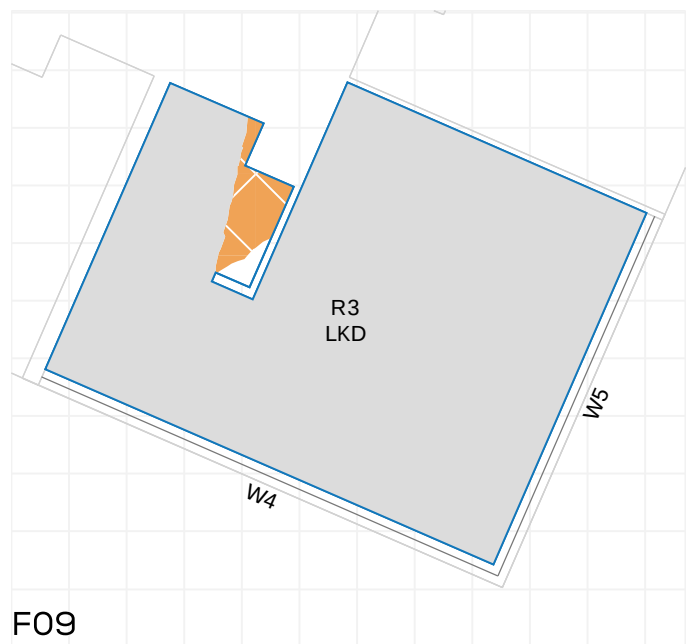
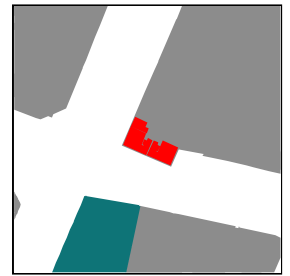
KEY:

GAIN

LOSS

MAINTAINED LIT AREA

1 METRE GRID



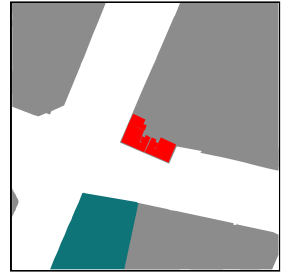
NSL CONTOURS



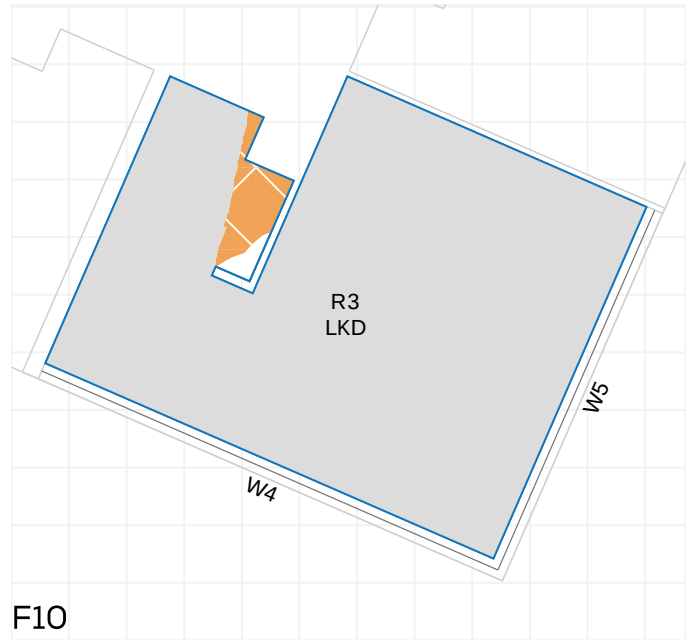
PROJECT: 0368 - 39 DEANS GATE, MANCHESTER
REPORT TITLE: EXISTING VS. PROPOSED
ADDRESS: NO.1 DEANS GATE
DATE: 25/11/2019
SCHEME IR: IR07
DRAWING No.: 0368-REL02-IS01-DD4

KEY:

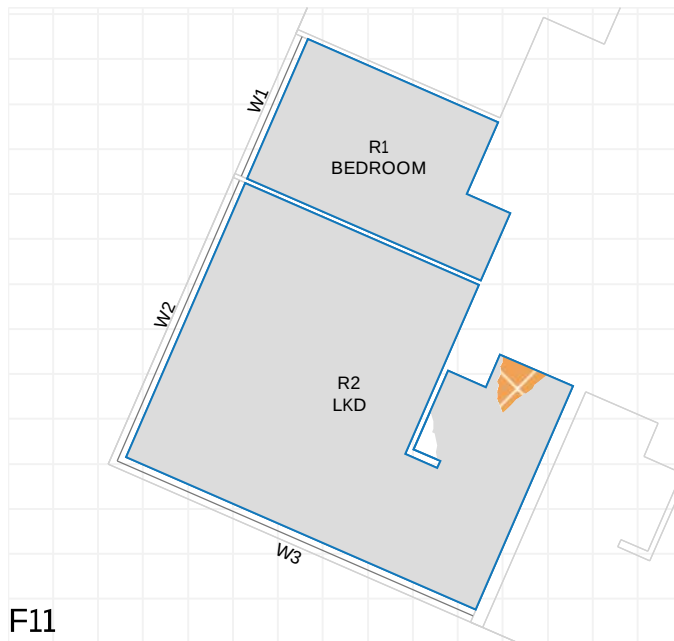
- GAIN
- LOSS
- MAINTAINED LIT AREA
- 1 METRE GRID



F10



F10



F11



F11

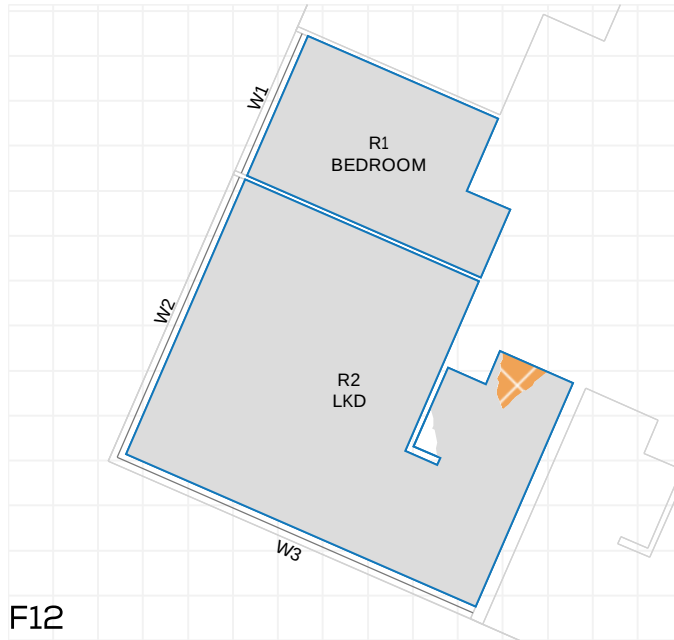
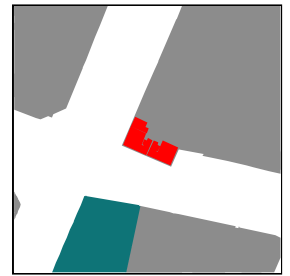
NSL CONTOURS



PROJECT: 0368 - 39 DEANS GATE, MANCHESTER
REPORT TITLE: EXISTING VS. PROPOSED
ADDRESS: NO.1 DEANS GATE
DATE: 25/11/2019
SCHEME IR: IR07
DRAWING No.: 0368-REL02-IS01-DD5

KEY:

- GAIN
- LOSS
- MAINTAINED LIT AREA
- 1 METRE GRID



F12



F12



F13



F13

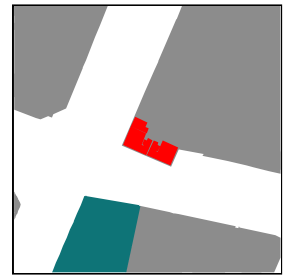
NSL CONTOURS



PROJECT: 0368 - 39 DEANS GATE, MANCHESTER
REPORT TITLE: EXISTING VS. PROPOSED
ADDRESS: NO.1 DEANS GATE
DATE: 25/11/2019
SCHEME IR: IR07
DRAWING No.: 0368-REL02-IS01-DD6

KEY:

- GAIN
- LOSS
- MAINTAINED LIT AREA
- 1 METRE GRID



F14



F14



F15

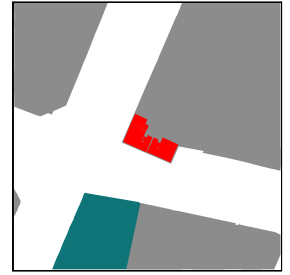


F15

PROJECT: 0368 - 39 DEANS GATE, MANCHESTER
 REPORT TITLE: EXISTING VS. PROPOSED
 ADDRESS: NO.1 DEANS GATE
 DATE: 25/11/2019
 SCHEME IR: IR07
 DRAWING No.: 0368-REL02-IS01-DD7

KEY:

- GAIN
- LOSS
- MAINTAINED LIT AREA
- 1 METRE GRID



FLOOR	ROOM	PROPERTY TYPE	ROOM USE	TARGET	EX.	PR.	LOSS	LOSS %	MEETS CRITERIA
NO.1 DEANS GATE									
F04	R1	RESIDENTIAL	BEDROOM	1	4.9	4.9	0.0	0.0%	YES
	R2	RESIDENTIAL	LKD	2	10.0	8.4	1.6	16.0%	YES
	R3	RESIDENTIAL	LKD	2	10.7	9.3	1.4	13.1%	YES
F05	R1	RESIDENTIAL	BEDROOM	1	4.3	4.3	0.0	0.0%	YES
	R2	RESIDENTIAL	LKD	2	8.7	7.2	1.5	17.2%	YES
	R3	RESIDENTIAL	LKD	2	9.4	8.0	1.4	14.9%	YES
F06	R1	RESIDENTIAL	BEDROOM	1	4.4	4.4	0.0	0.0%	YES
	R2	RESIDENTIAL	LKD	2	9.0	7.3	1.7	18.9%	YES
	R3	RESIDENTIAL	LKD	2	9.7	8.2	1.5	15.5%	YES
F07	R1	RESIDENTIAL	BEDROOM	1	4.5	4.5	0.0	0.0%	YES
	R2	RESIDENTIAL	LKD	2	9.3	7.5	1.8	19.4%	YES
	R3	RESIDENTIAL	LKD	2	10.0	8.4	1.6	16.0%	YES
F08	R1	RESIDENTIAL	BEDROOM	1	4.7	4.7	0.0	0.0%	YES
	R2	RESIDENTIAL	LKD	2	9.6	7.7	1.9	19.8%	YES
	R3	RESIDENTIAL	LKD	2	10.2	8.5	1.7	16.7%	YES
F09	R1	RESIDENTIAL	BEDROOM	1	4.8	4.8	0.0	0.0%	YES
	R2	RESIDENTIAL	LKD	2	9.8	7.8	2.0	20.4%	YES
	R3	RESIDENTIAL	LKD	2	10.5	8.7	1.8	17.1%	YES
F10	R1	RESIDENTIAL	BEDROOM	1	5.0	5.0	0.0	0.0%	YES
	R2	RESIDENTIAL	LKD	2	10.1	8.0	2.1	20.8%	YES
	R3	RESIDENTIAL	LKD	2	10.6	8.8	1.8	17.0%	YES
F11	R1	RESIDENTIAL	BEDROOM	1	5.1	5.1	0.0	0.0%	YES
	R2	RESIDENTIAL	LKD	2	10.2	8.2	2.0	19.6%	YES
	R3	RESIDENTIAL	LKD	2	10.7	8.9	1.8	16.8%	YES
F12	R1	RESIDENTIAL	BEDROOM	1	5.3	5.2	0.1	1.9%	YES
	R2	RESIDENTIAL	LKD	2	10.3	8.4	1.9	18.4%	YES
	R3	RESIDENTIAL	LKD	2	10.7	9.0	1.7	15.9%	YES
F13	R1	RESIDENTIAL	BEDROOM	1	5.4	5.4	0.0	0.0%	YES
	R2	RESIDENTIAL	LKD	2	10.5	8.6	1.9	18.1%	YES
	R3	RESIDENTIAL	LKD	2	10.7	9.1	1.6	15.0%	YES
F14	R1	RESIDENTIAL	BEDROOM	1	5.5	5.5	0.0	0.0%	YES
	R2	RESIDENTIAL	LKD	2	10.6	8.8	1.8	17.0%	YES
	R3	RESIDENTIAL	LKD	2	10.7	9.2	1.5	14.0%	YES
F15	R1	RESIDENTIAL	BEDROOM	1	5.6	5.6	0.0	0.0%	YES
	R2	RESIDENTIAL	LKD	2	10.6	9.0	1.6	15.1%	YES
	R3	RESIDENTIAL	LKD	2	10.7	9.3	1.4	13.1%	YES
F16	R1	RESIDENTIAL	BEDROOM	1	5.7	5.7	0.0	0.0%	YES
	R2	RESIDENTIAL	LKD	2	10.7	9.2	1.5	14.0%	YES
	R3	RESIDENTIAL	LKD	2	10.7	9.5	1.2	11.2%	YES

					VSC (ROOM)					NSL					APSH (ROOM)						
FLOOR	ROOM	PROPERTY	ROOM	WINDOW	EX	PR	LOSS	LOSS	MEETS	EX	PR	LOSS	LOSS	MEETS	EX		PR		LOSS %		MEETS
		TYPE	USE		%	%		%	CRITERIA	%	%	SOM	%	CRITERIA	ANNUAL	WINTER	ANNUAL	WINTER	ANNUAL	WINTER	
NO.1 DEANS GATE																					
F04	R1	RESIDENTIAL	BEDROOM	W1/F04											N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R2	RESIDENTIAL	LKD	W2/F04											74	18	57	13	23.0%	27.8%	YES
			LKD	W3/F04																	
	R3	RESIDENTIAL	LKD	W4/F04											86	20	67	15	22.1%	25.0%	YES
			LKD	W5/F04																	
F05	R1	RESIDENTIAL	BEDROOM	W1/F05											N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R2	RESIDENTIAL	LKD	W2/F05											77	21	58	15	24.7%	28.6%	YES
			LKD	W3/F05																	
	R3	RESIDENTIAL	LKD	W4/F05											94	25	73	17	22.3%	32.0%	YES
			LKD	W5/F05																	
F06	R1	RESIDENTIAL	BEDROOM	W1/F06											N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R2	RESIDENTIAL	LKD	W2/F06											80	24	60	17	25.0%	29.2%	YES
			LKD	W3/F06																	
	R3	RESIDENTIAL	LKD	W4/F06											95	26	75	18	21.1%	30.8%	YES
			LKD	W5/F06																	
F07	R1	RESIDENTIAL	BEDROOM	W1/F07											N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R2	RESIDENTIAL	LKD	W2/F07											81	25	62	18	23.5%	28.0%	YES
			LKD	W3/F07																	
	R3	RESIDENTIAL	LKD	W4/F07											97	28	76	19	21.6%	32.1%	YES
			LKD	W5/F07																	
F08	R1	RESIDENTIAL	BEDROOM	W1/F08											N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R2	RESIDENTIAL	LKD	W2/F08											84	28	61	18	27.4%	35.7%	YES
			LKD	W3/F08																	
	R3	RESIDENTIAL	LKD	W4/F08											97	28	76	19	21.6%	32.1%	YES
			LKD	W5/F08																	
F09	R1	RESIDENTIAL	BEDROOM	W1/F09											N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R2	RESIDENTIAL	LKD	W2/F09											84	28	62	18	26.2%	35.7%	YES
			LKD	W3/F09																	
	R3	RESIDENTIAL	LKD	W4/F09											97	28	76	19	21.6%	32.1%	YES
			LKD	W5/F09																	
F10	R1	RESIDENTIAL	BEDROOM	W1/F10											N/A	N/A	N/A	N/A	N/A	N/A	N/A

(1) KITCHEN SMALLER THAN 13m2

(2) INC\HZ = SKY COMPONENT (INCLINED\HORIZONTAL WINDOWS)

(3) SINGLE ASPECT ROOM DEEPER THAN 5m

					VSC (ROOM)					NSL					APSH (ROOM)						
FLOOR	ROOM	PROPERTY	ROOM	WINDOW	EX	PR	LOSS	LOSS	MEETS	EX	PR	LOSS	LOSS	MEETS	EX		PR		LOSS %		MEETS
		TYPE	USE		%	%		%	CRITERIA	%	%	SQM	%	CRITERIA	ANNUAL	WINTER	ANNUAL	WINTER	ANNUAL	WINTER	
NO.1 DEANSGATE (CONTINUED)																					
	R2	RESIDENTIAL	LKD	W2/F10											84	28	63	18	25.0%	35.7%	YES
			LKD	W3/F10																	
	R3	RESIDENTIAL	LKD	W4/F10											99	29	77	19	22.2%	34.5%	YES
			LKD	W5/F10																	
F11	R1	RESIDENTIAL	BEDROOM	W1/F11											N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R2	RESIDENTIAL	LKD	W2/F11											85	28	64	18	24.7%	35.7%	YES
			LKD	W3/F11																	
	R3	RESIDENTIAL	LKD	W4/F11											99	29	77	19	22.2%	34.5%	YES
			LKD	W5/F11																	
F12	R1	RESIDENTIAL	BEDROOM	W1/F12											N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R2	RESIDENTIAL	LKD	W2/F12											86	28	66	18	23.3%	35.7%	YES
			LKD	W3/F12																	
	R3	RESIDENTIAL	LKD	W4/F12											99	29	78	19	21.2%	34.5%	YES
			LKD	W5/F12																	
F13	R1	RESIDENTIAL	BEDROOM	W1/F13											N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R2	RESIDENTIAL	LKD	W2/F13											86	28	70	18	18.6%	35.7%	YES
			LKD	W3/F13																	
	R3	RESIDENTIAL	LKD	W4/F13											99	29	82	20	17.2%	31.0%	YES
			LKD	W5/F13																	
F14	R1	RESIDENTIAL	BEDROOM	W1/F14											N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R2	RESIDENTIAL	LKD	W2/F14											86	28	71	18	17.4%	35.7%	YES
			LKD	W3/F14																	
	R3	RESIDENTIAL	LKD	W4/F14											99	29	85	20	14.1%	31.0%	YES
			LKD	W5/F14																	
F15	R1	RESIDENTIAL	BEDROOM	W1/F15											N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R2	RESIDENTIAL	LKD	W2/F15											86	28	75	18	12.8%	35.7%	YES
			LKD	W3/F15																	
	R3	RESIDENTIAL	LKD	W4/F15											99	29	86	20	13.1%	31.0%	YES
			LKD	W5/F15																	
F16	R1	RESIDENTIAL	BEDROOM	W1/F16											N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R2	RESIDENTIAL	LKD	W2/F16											86	28	76	20	11.6%	28.6%	YES

					VSC (ROOM)					NSL					APSH (ROOM)						
FLOOR	ROOM	PROPERTY	ROOM	WINDOW	EX.	PR.	LOSS	LOSS	MEETS	EX.	PR.	LOSS	LOSS	MEETS	EX.		PR.		LOSS %		MEETS
		TYPE	USE		%	%		%	CRITERIA	%	%	SQM	%	CRITERIA	ANNUAL	WINTER	ANNUAL	WINTER	ANNUAL	WINTER	CRITERIA
NO.1 DEANS GATE (CONTINUED)																					
			LKD	W3/F16																	
	R3	RESIDENTIAL	LKD	W4/F16											99	29	87	20	12.1%	31.0%	YES
			LKD	W5/F16																	

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