



DAYLIGHT & SUNLIGHT

IMPACT ON NEIGHBOURING
PROPERTIES

Greenheys, Manchester Science Park

25 April 2023

GIA No: 2280

PROJECT DATA:

Client **Bruntwood SciTech**
Architect **BDP Architects**
Project Title **Greenheys, Manchester Science Park**
Project Number **2280**

REPORT DATA:

Report Title **Impact on Neighbouring Properties**
GIA Department **Daylight & Sunlight**
Dated **25 April 2023**
Prepared by **EP**
Checked by **MB**
Type **Client Issue**

Revisions	No:	Date:	Notes:	Signed:

Client:

Bruntwood SciTech

Issue Date:

April 2023

Document References:

2280-mb-23-0425(DaySun Report)
Principles of Daylight and Sunlight
Existing Drawings: 2280-REL01-IS02-001 to 2280-REL01-IS02-003
Proposed Drawings: 2280-REL01- IS02-004 to 2280-REL01- IS02-006
Results and Window Maps

Author for and Behalf of GIA:

Michael Beatty

Authorisation for GIA:

A handwritten signature in black ink, appearing to read 'Beatty', with a long horizontal flourish extending to the right.

This report is intended solely for Bruntwood SciTech and may contain confidential information. The Liability of this Report extends to Bruntwood SciTech and their duly appointed advisors. No part or whole of its contents may be disclosed to or relied upon by any Third Parties without the consent of this Practice. This report is accurate as at the date of publication but does not take into account anything that has happened since the date of this report.

Section	Page
1.0 Executive Summary	1
2.0 Instructions	2
3.0 Introduction	3-4
4.0 Sources of Information	5
5.0 Assumptions	6
6.0 The Site	7
7.0 The Proposal	8
8.0 Surrounding Properties	9-13
9.0 Conclusions	14

Appended to this report:

Appendix 01	-	Principles of Daylight and Sunlight
Appendix 02	-	Existing Drawings
Appendix 03	-	Proposed Drawings
Appendix 04	-	Results and Window Maps

1.0 Executive Summary

We have undertaken a daylight and sunlight assessment for the proposed development at Greenheys, Manchester Science Park.

We have completed 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 (2022)'.

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.

Notwithstanding, the results indicate an excellent level of compliance for the surrounding properties that have been assessed. The results for each property are summarised in the table below:

Name/Address of Building	Percentage of Windows Above Guidelines for VSC Daylight	Percentage of Rooms Above Guidelines for NSL Daylight	Percentage of Rooms Above Guidelines for APSH Sunlight
18 Greenheys Lane	6/6 (100%)	6/6 (100%)	-
12 Greenheys Lane	3/3 (100%)	3/3 (100%)	-
24-36 Greenheys Lane	85/93 (92%)	44/44 (100%)	37/38 (97%)

Overall, considering the limited impacts and the flexibility with which the BRE guide is intended to be used, the impact of the scheme on the surrounding residential properties is considered wholly acceptable.

2.0 Instructions

GIA have been instructed by Bruntwood SciTech to undertake a detailed technical assessment to understand the potential daylight and sunlight changes that the proposed development at Greenheys, Manchester Science Park will have upon the surrounding sensitive receptors.

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 2022) 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.

3.0 Introduction

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 (2022)*'. 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.

Daylight

The BRE set out various methods for assessing the daylight in existing surrounding residential buildings within the handbook. These are summarised below.

Vertical Sky Component (VSC)

This method of assessment can be undertaken using a skylight indicator or a Waldram diagram. It measures from a single point, at the centre of the window (if known at the early design stage), the quantum of sky visible taking into account all external obstructions. Whilst these obstructions can be either other buildings or the general landscape, trees are usually ignored unless they form a continuous or dense belt of obstruction.

The VSC method is a useful 'rule of thumb' but has some significant limitations in determining the true quality of daylight within a proposed building. It does not take into account the size of the window, any reflected light off external obstructions, any reflected light within the room, or the use to which that room is put. Appendix C of the guide goes into more detail on these matters and sets forward alternative methods for assessment to overcome these limitations.

No Sky Line (NSL)

This method of assessment is a simple test to establish where within the proposed room the sky will be visible through the windows, taking into account external obstructions. The assessment is undertaken at working plane height (850mm above floor level) and the method of calculation is set out in Appendix D of the BRE handbook.

Appendix C of the BRE handbook states "*If a significant area of the working plane (normally more than 20%) lies beyond the no sky line (i.e. it receives no direct skylight) then the distribution of daylight in the room will look poor and supplementary electric lighting will be required.*" To guarantee a satisfactory daylight uniformity, the area which does not receive direct skylight should not exceed 20% of the floor area, as quantified in the BS 8206 Part2 2008.

Sunlight

The BRE provide guidance in respect of sunlight quality within the handbook. It is generally acknowledged that the presence of sunlight is more significant in residential accommodation than it is in commercial properties, and this is reflected in the BRE document.

It states, *"in housing, the main requirement for sunlight is in living rooms, where it is valued at any time of the day, but especially in the afternoon. Sunlight is also required in conservatories. It is viewed as less important in bedrooms and in kitchens where people prefer it in the morning rather than the afternoon."*

The BRE guide considers the critical aspects of orientation and overshadowing in determining the availability of sunlight at a proposed development site.

The guide proposes minimising the number of dwellings whose living room face solely north unless there is some compensating factor such as an appealing view to the north, and it suggests a number of techniques to do so. Furthermore, it discusses massing solutions with a sensitive approach to overshadowing, so as to maximise access to sunlight.

At the same time, it acknowledges that the site's existing urban environment may impose orientation or overshadowing constraints which may not be possible to overcome.

To quantify sunlight access for interiors where sunlight is expected, it refers to the BS 82606-2 criterion of Annual Probable Sunlight Hours. APSH is defined as *"the total number of hours in the year that the sun is expected to shine on unobstructed ground, allowing for average levels of cloudiness at the location in question."* In line with the recommendation, APSH is measured from a point on the inside face of the window, should the locations have been decided. If these are unknown, sunlight availability is checked at points 1.6m above the ground or the lowest storey level on each main window wall, and no more than 5m apart. If a room has multiple windows on the same wall or on adjacent walls, the highest value of APSH should be taken into account. If a room has two windows on opposite walls, the APSH for each can be added together.

The summary of sunlight within the guide is as follows:

"In general, a dwelling or non-domestic building which has a particular requirement for sunlight, will appear reasonably sunlit provided that:

- At least one main window faces within 90 degrees of due south, and*
- The centre of at least one window to a main living room can receive 25% of annual probable sunlight hours, including at least 5% of annual probable sunlight hours in the winter months between 21 September and 21 March. "*

In paragraph 3.1.11 the BRE guidance suggests that if a room faces significantly North of due East or West it is unlikely to meet the recommended levels proposed by the BS 8206-2. As such, it is clear that only living room windows facing within 90 degrees of due south can be assessed using this methodology.

4.0 Sources of Information

In compiling this report, we have used the following information:

GIA

Site photographs

VU.CITY

Baseline Model

BDP Architects

IR04-20230901

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 existing commercial buildings to the north, Pencroft Way to the east, Base to the south and Greenheys Lane to the west. The drawing extract below shows the existing site:

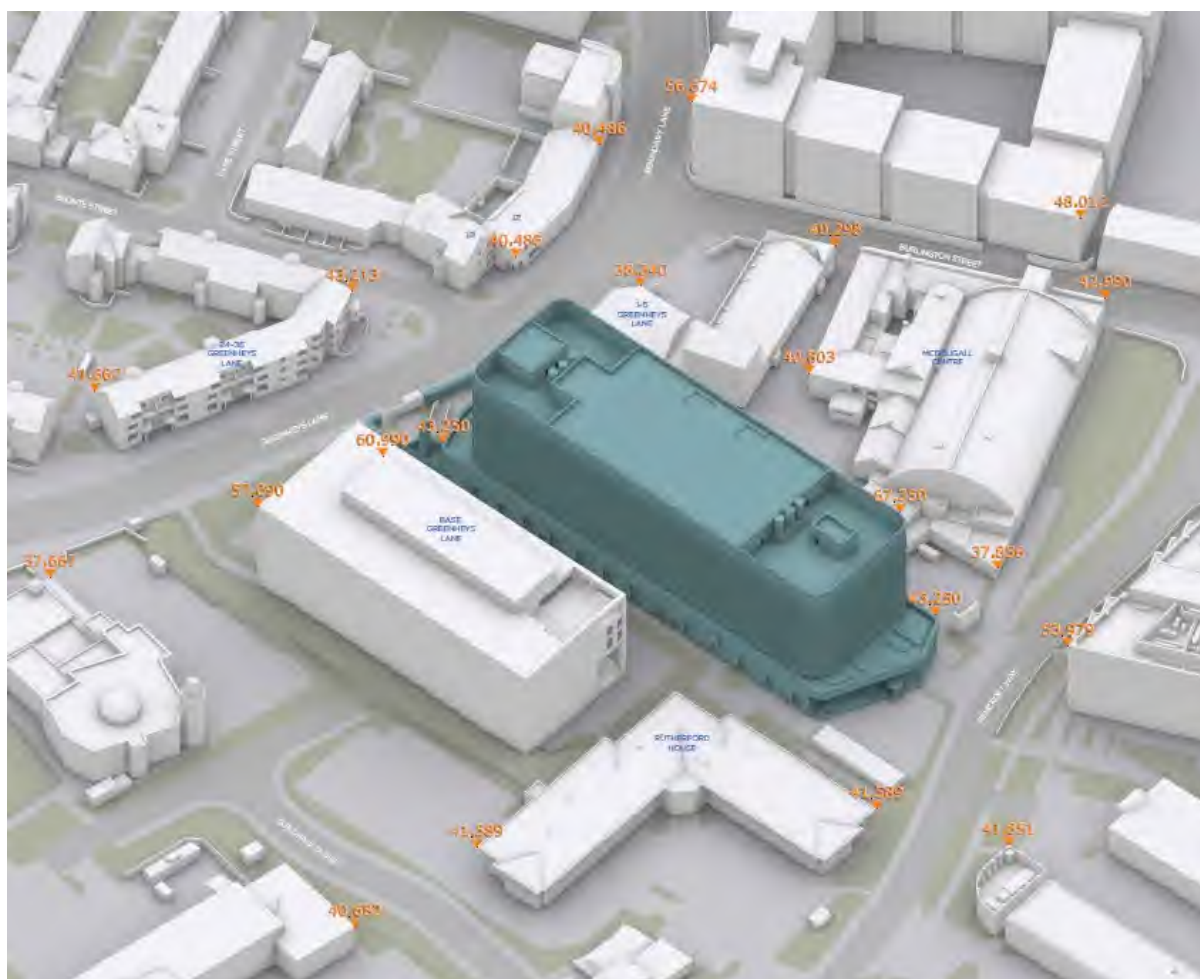


Our understanding of this existing building and the surrounding context is depicted on GIA drawings 2280-REL01-IS01-01, 2280-REL01-IS01-02 and 2280-REL01-IS01-03 within Appendix 02.

7.0 The Proposal

GIA's understanding of the proposed scheme is illustrated in drawings 2280-REL01-IS01-04, 2280-REL01-IS01-05 and 2280-REL01-IS01-06 shown within Appendix 03.

Our analysis of this option is based on the proposed scheme drawings produced by BDP Architects received on 9 January 2023:



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.

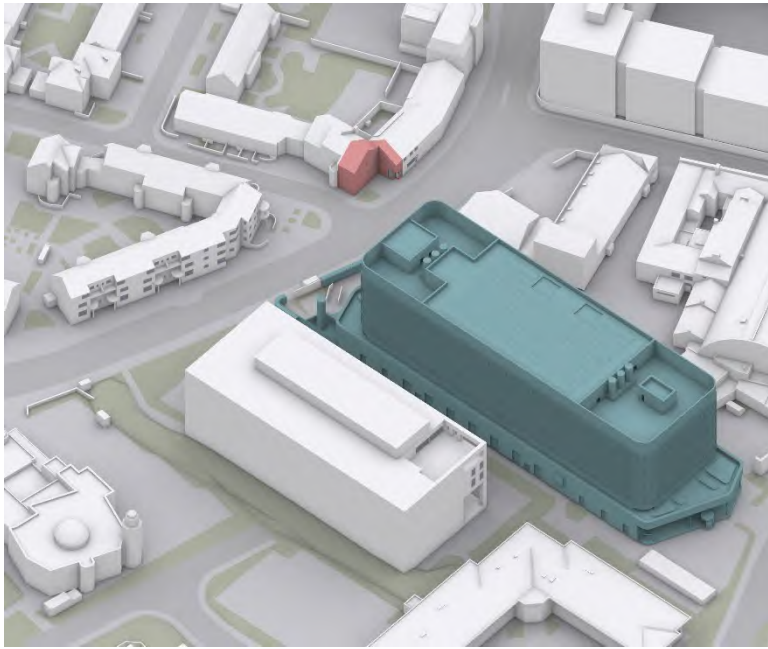
The benchmark condition of the site allows us to calculate the daylight and sunlight conditions within the neighbouring buildings. From this, we can then compare them with the conditions within these properties assuming the current proposed development is in place.

Those 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)
18 Greenheys Lane	Residential	West
12 Greenheys Lane	Residential	West
24-36 Greenheys Lane	Residential	West

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

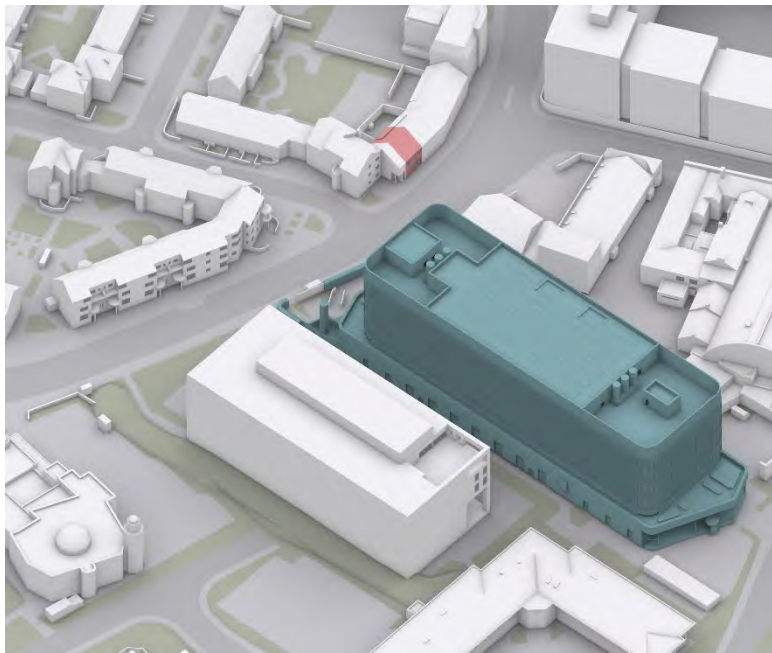
18 Greenheys Lane



Name/Address of Building	Percentage of Windows Above Guidelines for VSC Daylight	Percentage of Rooms Above Guidelines for NSL Daylight	Percentage of Rooms Above Guidelines for APSH Sunlight
18 Greenheys Lane	6/6 (100%)	6/6 (100%)	-

With the proposed development in place, this property will fully accord with the BRE target criteria for VSC daylight and NSL daylight. There are no rooms overlooking the proposed development that face within 90 degrees of due south, and so no sunlight assessment is required.

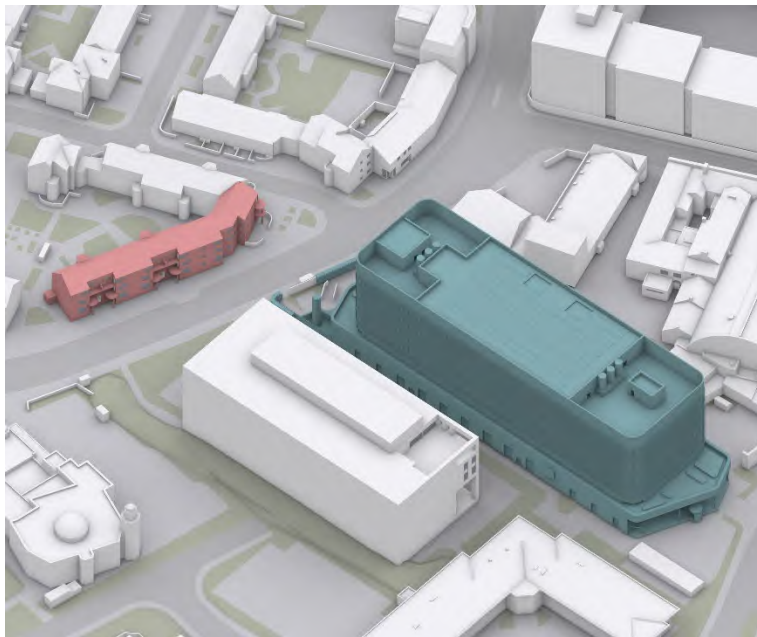
12 Greenheys Lane



Name/Address of Building	Percentage of Windows Above Guidelines for VSC Daylight	Percentage of Rooms Above Guidelines for NSL Daylight	Percentage of Rooms Above Guidelines for APSH Sunlight
12 Greenheys Lane	3/3 (100%)	3/3 (100%)	-

With the proposed development in place, this property will fully accord with the BRE target criteria for VSC daylight and NSL daylight. There are no rooms overlooking the proposed development that face within 90 degrees of due south, and so no sunlight assessment is required.

24-36 Greenheys Lane



Name/Address of Building	Percentage of Windows Above Guidelines for VSC Daylight	Percentage of Rooms Above Guidelines for NSL Daylight	Percentage of Rooms Above Guidelines for APSH Sunlight
24-36 Greenheys Lane	85/93 (92%)	44/44 (100%)	37/38 (97%)

With the proposed development in place, this property will fully accord with the BRE criteria for NSL daylight.

85 of the 93 windows assessed for VSC daylight will fully accord with the BRE target criteria. Of the eight which do not, five are reduced by between 20-30%, which is considered by the BRE to be a minor reduction. Two windows suffer a moderate reduction of between 30-40% and one window is reduced by more than 40%.

All of the windows which do not meet the VSC daylight criteria are located beneath balconies and therefore currently have very low baseline levels without the proposed development in place. The BRE states that a reduction of 20% or less would not be noticeable to occupants, meaning a window which meets the 27% VSC daylight target without the proposed development in place could be reduced by 5.4% without being noticeable. However, the low baseline levels to these windows means that small reductions in VSC lead to proportionally higher percentage changes. The worst affected window experiences a reduction of 2.5% VSC, which would not be noticeable were it currently achieving 27% VSC, but it does not meet the target as the window currently receives just 5.6% VSC. Locating windows beneath balconies therefore places a burden on the development site to maintain low existing levels. However, a small proportion of windows do not meet the VSC criteria and the impact is therefore considered acceptable.

One room does not meet BRE target criteria for APSH sunlight. The room in question suffers a moderate reduction of between 30-40% and has low baseline levels as discussed above. As such, the impacts are limited and considered acceptable.

Overall, reductions in daylight and sunlight are isolated and typically minor. As such, given the flexibility with which the BRE guide is intended to be used and the self-limiting design of 24-36 Greenheys Lane, the impacts are considered wholly acceptable.

9.0 Conclusions

We have undertaken a daylight and sunlight assessment for the proposed development at Greenheys, Manchester Science Park.

We have completed 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 (2022)'.

The surrounding residential properties will generally exhibit excellent levels of daylight and sunlight with the proposed development in place, and the overall impact of the scheme is considered wholly acceptable.

Appendix 01

Principles of Daylight and Sunlight

PRINCIPLES OF DAYLIGHT, SUNLIGHT & OVERSHADOWING

The Building Research Establishment (BRE) have set out in their handbook 'Site Layout Planning for Daylight & Sunlight: A Guide to Good Practice 3rd edition (2022)', guidelines and methodology for the measurement and assessment of daylight, sunlight and overshadowing.

1 BACKGROUND & CONTEXT

The quality of daylight and sunlight amenity as well as the overshadowing of open spaces is often stipulated within planning policy for protection or enhancement and a concern for adjoining owners and other interested parties.

The BRE Guidelines provide advice on site layout planning to determine the quality of daylight and sunlight both within buildings and reaching open spaces.

The BRE Guidelines note that the document is intended to be used in conjunction with the interior daylight recommendations found within the British Standard Daylight in buildings, BS EN 17037 and the CIBSE Publication LG 10 Daylighting – a guide for designers.

Whilst the BRE Guidelines are typically referred to for daylight sunlight and overshadowing matters within the planning process, they were not intended to be used as an instrument of planning policy, nor were the figures intended to be fixedly applied to all locations.

In the introduction of 'Site Layout Planning for daylight and sunlight (2022)', section 1.6 (page 7), 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 since 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 a 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".

Paragraph 2.2.3 (page 14) 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. The BRE approach to creating alternative criteria is detailed within Appendix F of the Document.

Paragraph 2.2.2 (page 14) of the document states:

The BRE Guidelines state that they are:

"intended for use for rooms in adjoining dwellings where daylight is required, including living rooms, kitchens, and bedrooms. Windows to bathrooms, toilets, storerooms, circulation areas, and garages need not be analysed."

Although primarily designed to be used for residential properties, 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, hotels and hostels, small workshops, and some offices.

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 and areas of amenity as well as the creation of proposed dwellings and spaces with high levels of daylight and sunlight amenity.

Although Local Authorities will look to the BRE Guide to understand impacts it is their Planning Policies that will determine whether the changes in light should be a reason for refusal at planning.

It is an inevitable consequence of the built-up urban environment that daylight and sunlight will be more limited in dense urban areas. It is well acknowledged that in such situations there may be many other conflicting and potentially more important planning and urban design matters to consider other than just the provision of ideal levels of daylight and sunlight.

The following sections extract relevant sections from the Guide.

2 EFFECTS TO DAYLIGHT

The BRE Guidelines provide two methodologies for daylight impact assessment, namely;

- 1 The Vertical Sky Component (VSC); and
- 2 The No Sky Line (NSL).

Vertical Sky Component (VSC)

The Vertical Sky Component (VSC) method is described in the Glossary of BRE Guidelines as the:

“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. Usually the ‘given vertical plane’ is the outside of a window wall. The VSC does not include reflected light, either from the ground or from other buildings”

Put simply, the VSC provides an assessment of the amount of skylight falling on a vertical plane (generally a window) directly from the sky, in the

circumstance of an overcast sky (CIE standard).

The national numerical value target “ideal” for VSC is 27%. The BRE Guidelines advise that upon implementation of a development, a window should retain a VSC value of 27% or at least 0.8 of its former value (i.e. no more than a 20% change) as per paragraph 2.2.23 of the Guide.

This form of assessment does not take account of window size, room use, room size, window number or dual aspect rooms. The assessment also assumes that all obstructions to the sky are 100% non-reflective thereby omitting the consideration of reflection and considering only the light coming directly from the sky.

The VSC calculation is undertaken in both the existing and proposed scenarios so as to make a comparison.

The image in Figure 01 depicts a Waldram Diagram which can be used to calculate the VSC. The existing buildings are solidly pictured with the proposed scheme semi-transparent in the foreground.

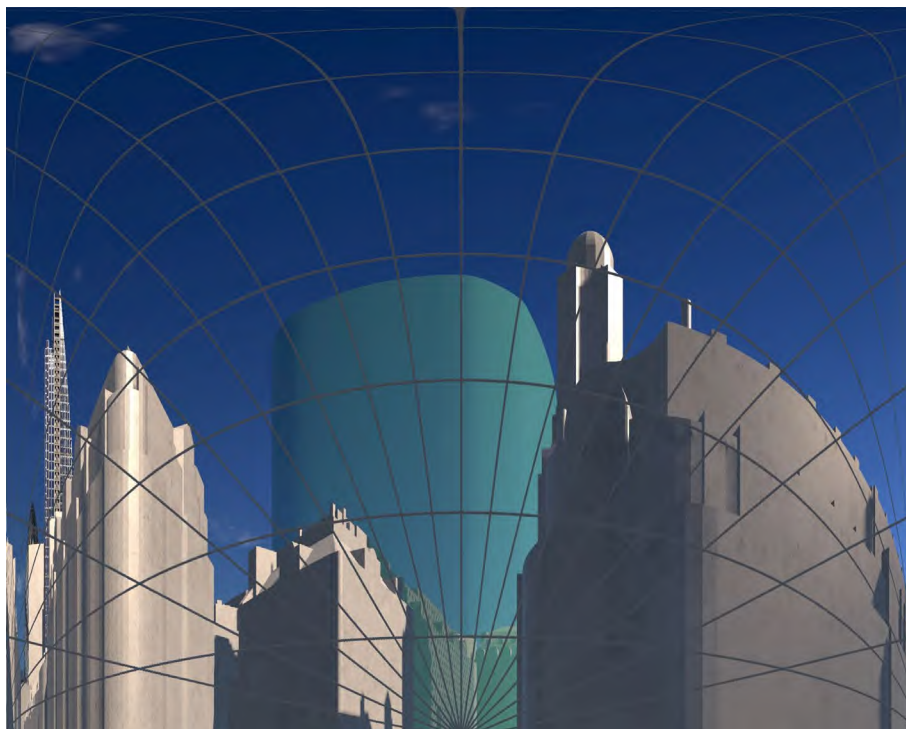


Fig. 01: Waldram diagram

No Sky Line (NSL)

In addition to the VSC, the BRE recommends the NSL method of assessment where internal layouts are known. Whilst the VSC provides information on the quantum of light reaching a window, the NSL seeks to provide information on how well this light is distributed within the room. The NSL is sometimes also referred to as 'Daylight Distribution' for this reason.

The NSL in the Glossary of the Guide as "the outline on the working plane of the area from which no sky can be seen." and so the NSL is effectively an assessment of sky visibility within a room. As stated already, the calculation is undertaken across the working plane which in accordance with paragraph 2.2.10 "in houses [...] is assumed to be horizontal and 0.85m high".

Again, both the existing and proposed positions are calculated and presented alongside any change in position of the NSL. The results can then be presented in table format or else illustrated on a contour plot if required, an example of which can be found in Figure 02 below.

The BRE Guidelines state at paragraph 2.211 that:

"If, following construction of a new development, the no sky line moves so that the area of the existing room, which does receive direct skylight, is reduced to less than 0.8 times its former value this will be noticeable to the occupants, and more of the room will appear poorly lit. This is also true if the no sky line encroaches on key areas like kitchen sinks and worktops."

In accordance with the strict application of the national numerical values, therefore the change in daylight would be noticeable to the occupants should the NSL experience a loss of NSL greater than 20%.

It is relevant to note that this assessment takes the number and size of windows serving a room into account as well as the shape of the room but, being concerned only with sky visibility and the distribution of light, does not consider the quantum of light reaching the room.

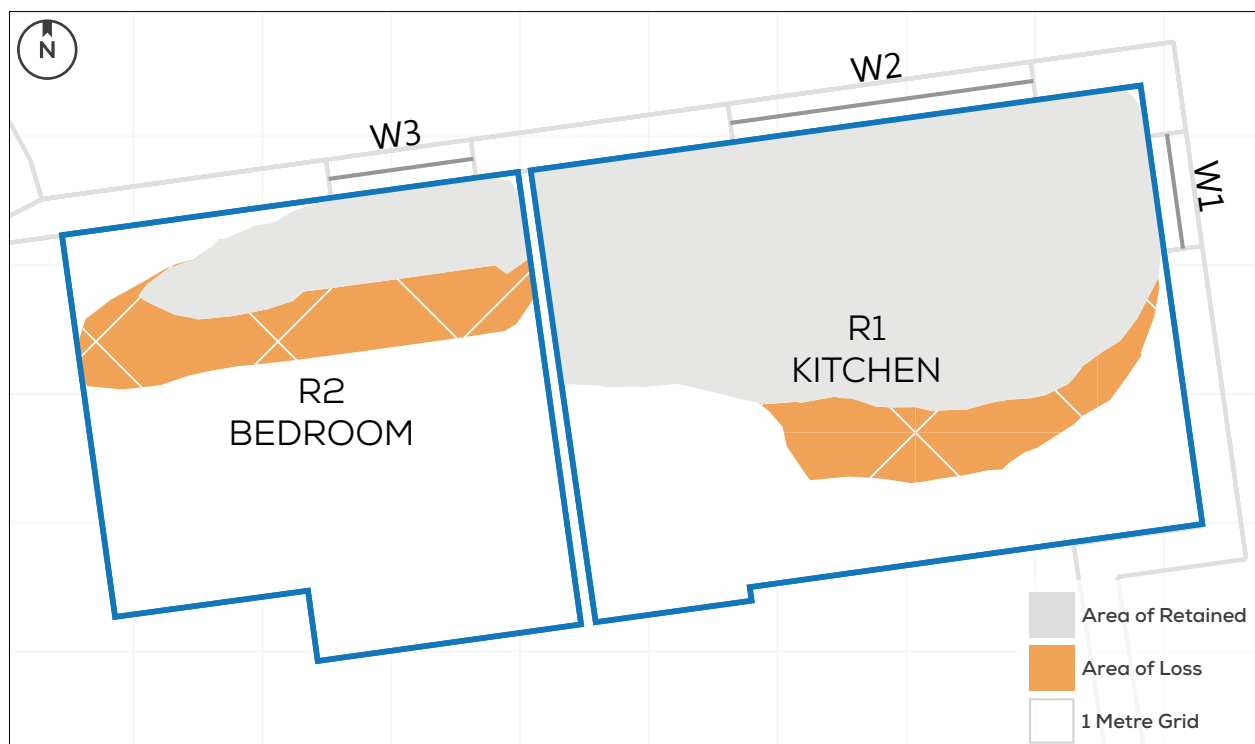


Fig. 02: Example NSL diagram

Decision Chart (Figure 20 of the BRE Guide)

The flowchart in Figure 03 illustrates the steps and criteria outlined within the BRE Guidelines to understand whether the daylighting (VSC and NSL) may be significantly affected.

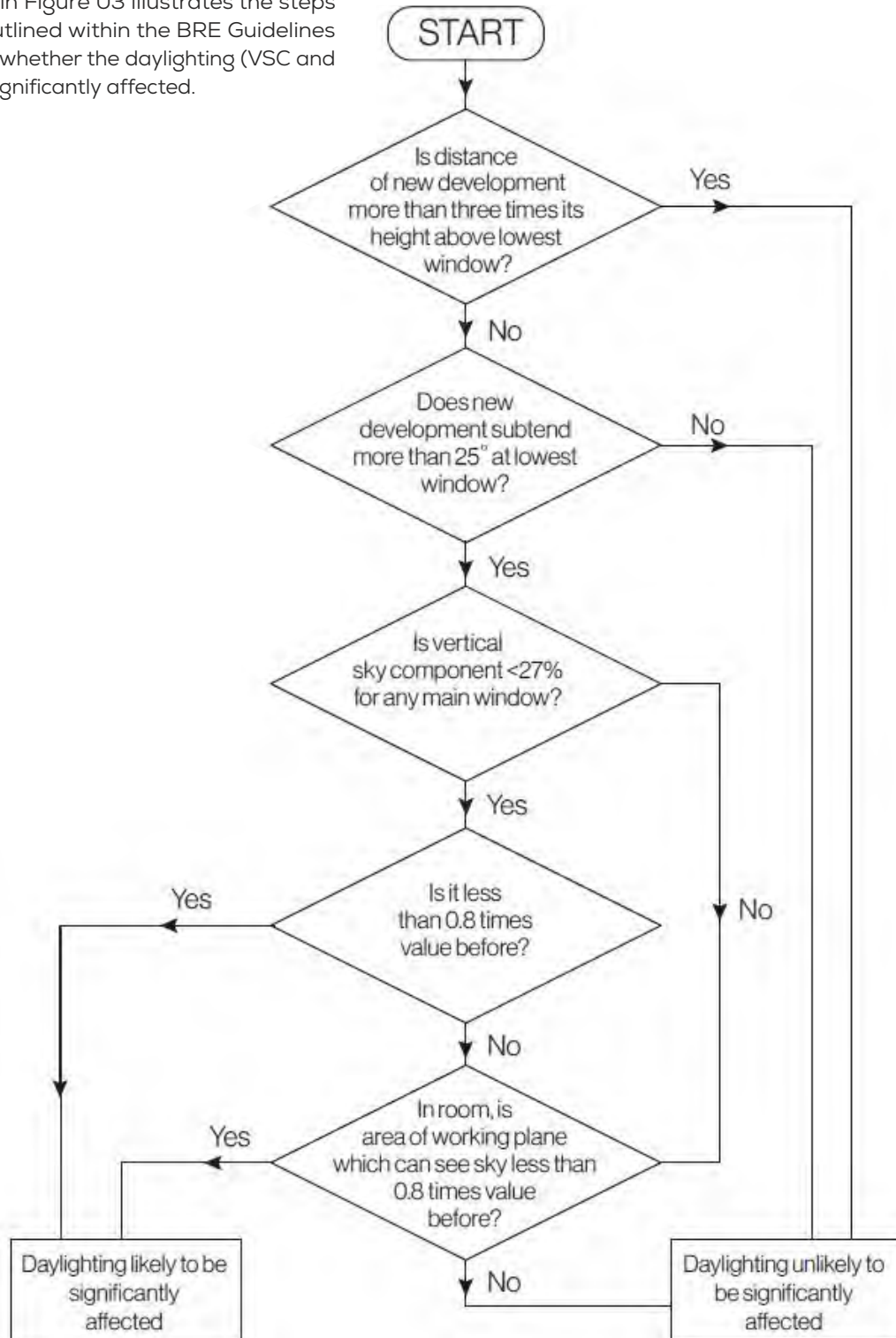


Fig. 03: BRE Decision Chart (Figure 20): diffuse daylight in existing buildings. This does not include an assessment of rights to light issues, which a developer may need to consider separately

3 EFFECTS TO SUNLIGHT

Annual Probable Sunlight Hours (APSH)

The BRE Guidance suggests that to understand sunlight impacts to a property, an assessment of Annual Probable Sunlight Hours (APSH) is undertaken. The APSH is defined in the Glossary as:

“the long-term average of the total number of hours during a year in which direct sunlight reaches the unobstructed ground (when clouds are taken into account)”

Expanding on the above, long-term averages were used to position 100 spots in the sky, representative of sunlight over the whole year. Correlating to the probability of the sun to shine, the majority of these (70) are at times to the six-months containing summer (from spring equinox to autumn equinox) which 30 are the ‘winter’ months from autumn equinox to spring. The APSH is calculated though calculating how many of these ‘spots’ can be seen from a location (normally a window) both overall and how many of these are during the winter months.

To understand the potential sunlight impacts therefore, all windows facing within 90 degrees of due south and overlooking the development are generally assessed for APSH.

The BRE Guidelines set out the overall methodology and criteria for the assessment of Sunlight in Chapter 3. The BRE Guidelines state in paragraph 3.2.3 and 3.2.5:

“To assess loss of sunlight to an existing building, it is suggested that all main living rooms of dwellings, and conservatories, should be checked if they have a window facing within 90 degrees of due south. Kitchens and bedrooms are less important, although care should be taken not to block too much sun.”

“A point at the centre of the window on the outside face of the window wall may be taken.”

In interpreting the results, the BRE Guidance states in summary 3.2.13 that:

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

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

The image in Figure 04 depicts the APSH sun spots overlaid on a Waldram Diagram. The existing buildings are solidly pictured with the proposed scheme semi-transparent in the foreground. The yellow spots indicate summer sun and the blue spots indicate winter sun.

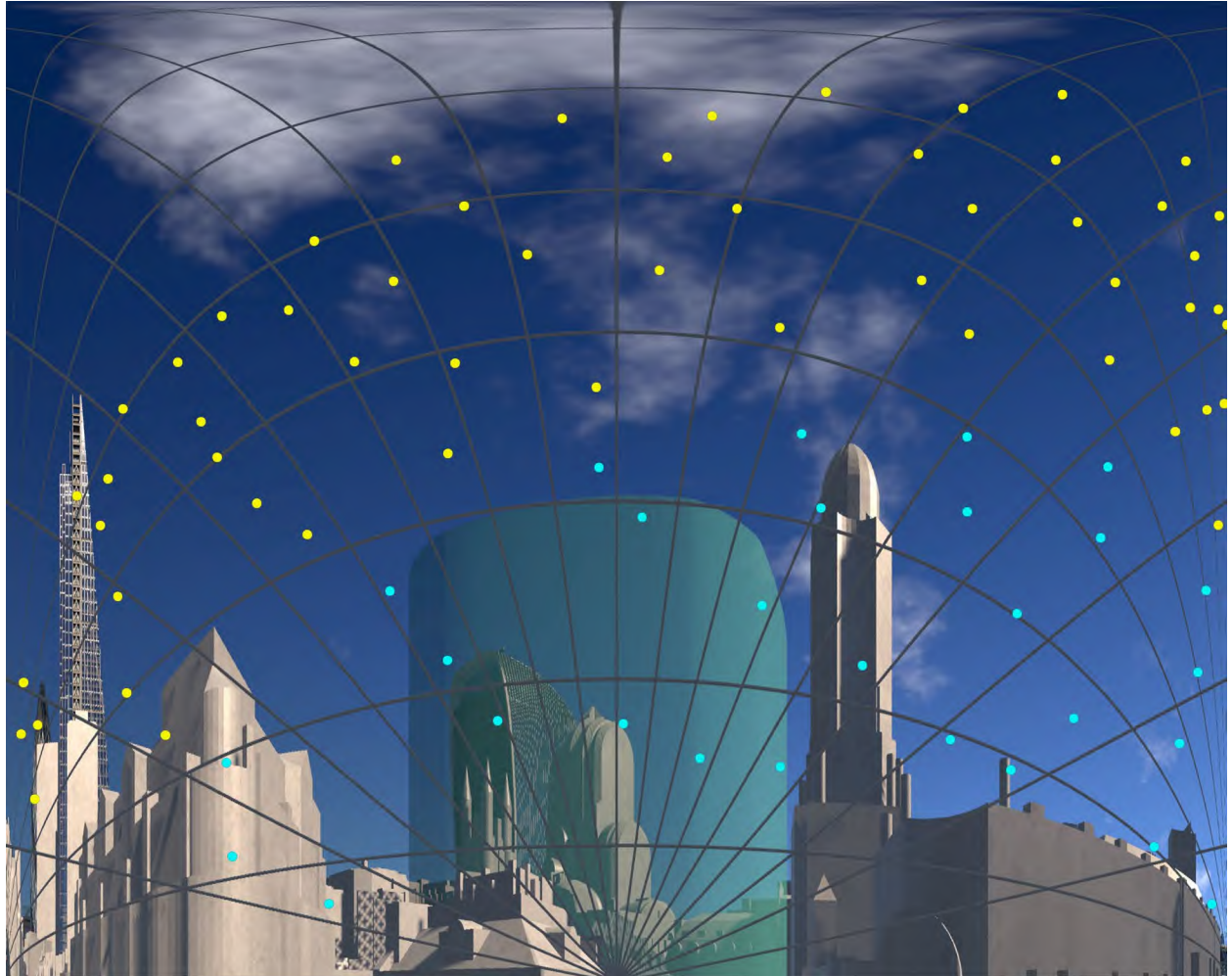


Fig. 04: Waldram diagram

4 EFFECTS TO OVERSHADOWING

The BRE guidance in respect of overshadowing of amenity spaces is set out in section 3.3.1 of the handbook. Here it states as follows:

“Sunlight in the spaces between and around buildings has an important impact on the overall appearance and ambiance of a development. It is valuable for a number of reasons, to:

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

It must be acknowledged that in urban areas the availability of sunlight on the ground is a factor which is significantly controlled by the existing urban fabric around the site in question and so may have very little to do with the form of the development itself. Likewise, there may be many other urban design, planning and site constraints which determine and run contrary to the best form, siting and location of a proposed development in terms of availability of sun on the ground.

Sun Hours on Ground & Transient Overshadowing

The Sun Hours on Ground method of overshadowing assessment uses specialist software to determine the sunlight exposure across an area of amenity.

The BRE Guidelines suggest that the Spring Equinox (21 March), being the year’s midpoint, is a suitable date for the assessment. Paragraph 3.3.17 states:

“It is recommended that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21 March. If as a result of new development an existing garden or amenity area does not meet the above, and the area which can receive two hours of sun on 21 March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable.”

The Transient Overshadowing study is recommended where large buildings are proposed which may affect a number of gardens or open spaces or where an area is particularly sensitive at certain times of day or year. For the purpose of this assessment, the additional shadow cast is mapped and highlighted at hourly intervals from sunrise to sunset on the following dates:

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

The BRE guidelines do not provide any suggested criteria for Transient Overshadowing, rather it is a qualitative assessment to aid understanding.

5 BRE GUIDELINES: ADDITIONAL DAYLIGHT AND SUNLIGHT TESTS

Daylight - VSC and APSH to Rooms

As outlined within the BRE Guidelines (paragraph 2.2.6), the VSC value is calculated for each window; however:

"If a room has two or more windows of equal size, the mean of their VSCs may be taken".

Where a room is served by two or more windows of the same or different sizes, the VSC value to the room can be calculated by applying an average weighting calculation to understand the VSC value to the room. The formula used is as follows;

$$\Sigma(Vn \cdot An) / \Sigma An$$

Where:

V = window VSC

A = window area

n = the number of windows

The BRE provide a methodology to calculate APSH in relation to the room and window, paragraph 3.1.12 states:

"If a room has multiple windows, the amount of sunlight received by each can be added together provided they occur at different times and sunlight hours are not double counted."

The above extract of the BRE is in relation to proposed units rather than existing buildings. It does, however, make sense to apply this methodology to existing rooms as well, when room layouts are known as a room served by multiple windows could receive the benefit of sunlight from all windows and not just one.

GIA calculate the APSH room assessment in the following way:

- 1 The sunlight hours (both winter and annual) are calculated for each window. Instead of simply returning the overall per cent pass rate, i.e. one figure for winter, and one for the whole year, the yes/no result of each of the 100 sun spots is tracked. For this accounting to work, each sun dot needs to be assigned a unique identifier, e.g. from 1 to 100;

- 2 The sets of 100 sun spots are combined for each room using Boolean logic, i.e. conjunctions of yes/no values. The outcome of this step is a set of 100 yes/no values corresponding to the 100 sun spots, but on a per-room basis. Each per-room dot is counted if it is unobstructed for at least one of its windows; and
- 3 The unobstructed sun dots for the room are summed up and expressed as a percentage of the total number of annual and winter spots.

Balconies/Overhangs

The BRE recognises that existing architectural features on neighbouring buildings such as balconies and overhangs inherently restrict the quantum of skylight to a window. The BRE Guidelines note on page 11, paragraph 2.1.17 and page 16, paragraph 2.2.13:

"This is a particular problem if there are large obstructions opposite; with the combined effect of the overhang and the obstruction, it may be impossible to see the sky from inside the room, and hence to receive any direct skylight or sunlight at all."

"Existing windows with balconies above them typically receive less daylight. Because the balcony cuts out light from the top part of the sky, even a modest obstruction opposite may result in a large relative impact on the VSC, and on the area receiving direct skylight. One way to demonstrate this would be to carry out an additional calculation of the VSC and the area receiving direct skylight, for both the existing and proposed situations, without the balcony in place."

As noted by the BRE Guidelines, where there are existing overhanging features, larger reductions in skylight and sunlight may be unavoidable and alternative criteria can be used. The guidance suggests that in such situations a calculation is carried out that excludes the balcony or the obstruction.

6 DAYLIGHT - MIRROR MASSING & ADJOINING DEVELOPMENT LAND

Alternative target Values for Skylight and Sunlight Access "Mirror Massing"

The BRE Guidelines provide a calculation for the VSC and APSH analysis to quantify an appropriate alternative value based on the context of an environment. This approach is known as the 'mirror image' analysis (see Figure 05).

The BRE notes in paragraph F5:

"where an existing building has windows that are unusually close to the site boundary and taking more than their fair share of light. Figure F3 shows an example where side windows of an existing building are close to the boundary. To ensure that new development matches the height and proportions of existing buildings, the VSC and APSH targets for these windows could be set to those for a 'mirror-image' building of the same height and size, an equal distance away on the other side of the boundary."

This analysis is used to understand the levels of Daylight (VSC) and Sunlight (APSH) that would be experienced by an extant neighbouring property if there were a building of the same height and extent opposite.

The mirror image assessment is fairly simplistic and is not, therefore, easily applied to large and complex site footprints which are not all built at equal distances from the site boundary or of the same footprint.

Adjoining Development Land

The "Adjoining Development Land" analysis provided within the BRE Guidelines is a simple test to ensure that a proposal is a reasonable distance from the boundary so as to "enable future nearby developments to enjoy a similar access to daylight." (2.3.1)

The BRE comments in paragraphs 2.3.3, 2.3.6 and 2.3.7 that:

"The diffuse daylight coming over the boundary may be quantified in the following way. As a first check, draw a section in a plane perpendicular to the boundary (Figure 21). If a road separates the two sites then the centre line of the road

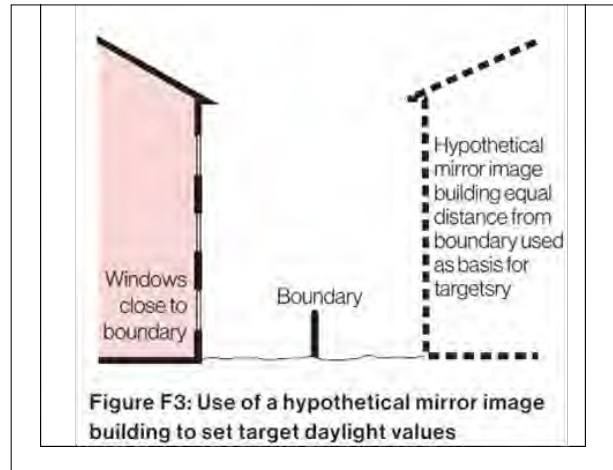


Fig. 05: Littlefair, P. (2022). Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: HIS BRE Press p 87 Figure F3

should be taken. Measure the angle to the horizontal subtended at a point 1.6 metres above the boundary by the proposed new buildings. If this angle is less than 43° then there will normally still be the potential for good daylighting on the adjoining development site (but see Sections 2.3.6 and 2.3.7)."

"The guidelines above should not be applied too rigidly. A particularly important exception occurs when the two sites are very unequal in size and the proposed new building is larger in scale than the likely future development nearby. This is because the numerical values above are derived by assuming the future development will be exactly the same size as the proposed new building (Figure 22). If the adjoining sites for development are a lot smaller, a better approach is to make a rough prediction of where the nearest window wall of the future development may be; then to carry out the 'new building' analysis in Section 2.1 for this window wall."

"The 43° angle should not be used as a form generator, to produce a building which slopes or steps down towards the boundary. Compare Figure 23 with Figure 22 to see how this can result in a higher than anticipated obstruction to daylight. In Figure 23 the proposed building subtends 34° at its mirror image, rather than the maximum of 25° suggested here. In cases of doubt, the best approach is again to carry out a new building analysis for the most likely location of a window wall of a future development."

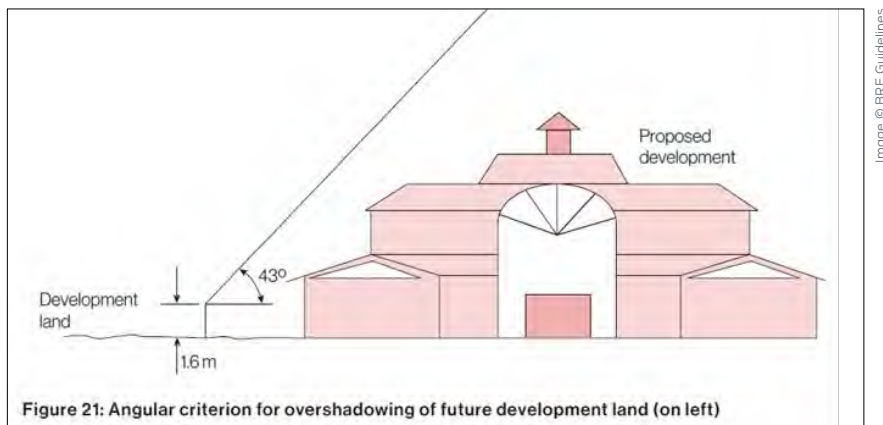


Fig. 06: Littlefair, P. (2022). Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: HIS BRE Press p 19 Figure 21

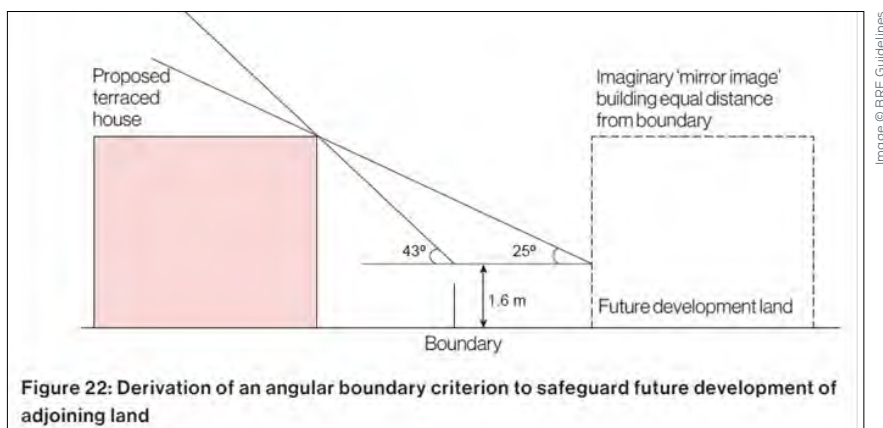


Fig. 07: Littlefair, P. (2022). Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: HIS BRE Press p 20 Figure 22

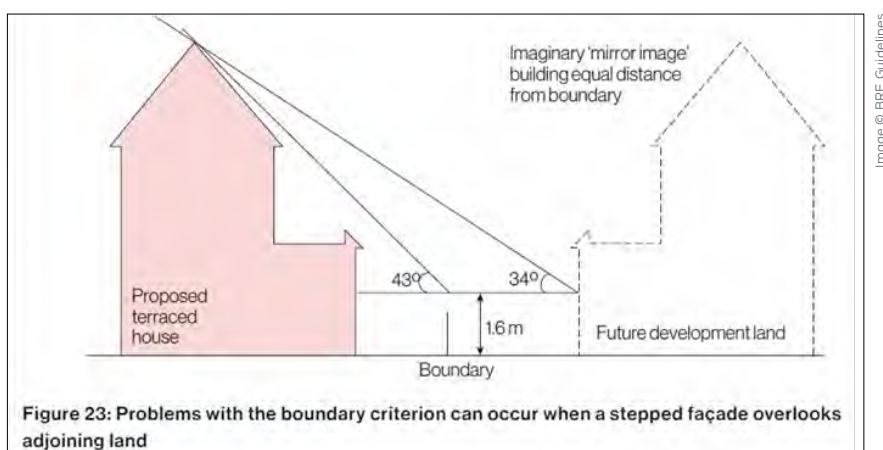


Fig. 08: Littlefair, P. (2022). Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: HIS BRE Press p 20 Figure 23

As outlined above, the Adjoining Development Land analysis is predicated on ensuring that a proposal next to future development land is not negatively impacting the ability to develop in consideration of light matters.

7 PHOTOVOLTAICS

Paragraph 4.5.2 states that “where a proposed development may result in loss of radiation to existing solar panels (either photovoltaic or solar thermal), an assessment should be carried out.”

Paragraph 4.5.8 states that “Where the annual probable sunlight hours received by a solar panel with the new development in place is less than 0.90 times the value before, a more detailed calculation of the loss of solar radiation should be undertaken. This is a specialist type of assessment and expert advice should be sought. The assessment should include both direct solar and diffuse sky radiation; over a whole year, around 60% of the radiation received on a horizontal roof comes from the sky. However, reflected radiation from the ground and obstructions need not be included. The modelling should take account of the effects of cloud in reducing direct solar radiation at different times of year, and include a realistic simulation of the way that incoming solar radiation varies from different parts of the sky.”

Paragraph 4.5.9 states that “if over the whole year the ratio of total solar radiation received with the new development, to the existing value is less than the values given in Table 2, then the loss of radiation is significant.”

Table 2. Recommended minimum ratios of solar radiation received.

Slope of solar panel in degrees to horizontal	Recommended minimum ratio of radiation received after/before
0-30	0.90
30.01-59.99	0.85
60-90	0.80

Fig. 09: Table 2 from BRE Guidance Section 4, page 36

Finally, paragraph 4.5.10 notes that “numerical values given are purely advisory. Different criteria may be used based on the requirements for solar energy in an area viewed against other site layout constraints. Another important issue is whether the existing solar panels are reasonably sited, at a sensible height and distance from the boundary. A greater loss of solar radiation may be inevitable if panels are mounted close to the ground and near to the site boundary.”

9 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:

- View;
- Privacy;
- Security;
- Access;
- Enclosure;
- Microclimate;
- Solar Dazzle; and
- Solar Convergence.

Appendix 02

Existing Drawings



SOURCES OF INFORMATION

IR01-20221201-Bruntwood
IR02-20221205-Research
IR03-20221205-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

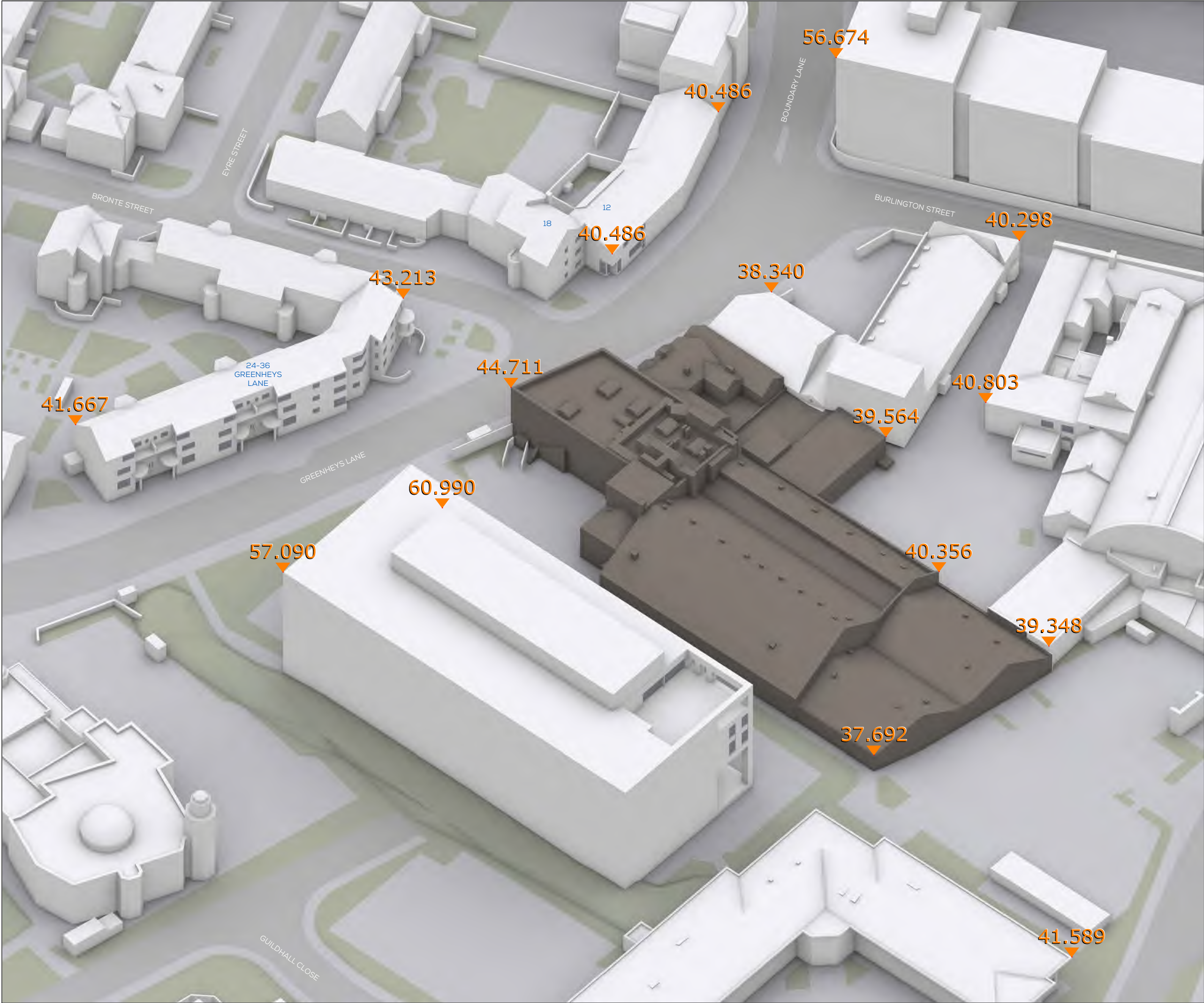
N.B. DO NOT SCALE OFF THIS DRAWING
PROJECT:
MANCHESTER SCIENCE PARK,
MANCHESTER

DRAWING NAME:
PLAN VIEW EXISTING

DWN BY	SCALE	CHK BY	STATUS	DATE
KS	NTS	SP	-	MAR23
PROJ No.	REL No.	IS No.	DWG No.	REV No.
2280	01	02	01	-

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

MANCHESTER • LONDON



SOURCES OF INFORMATION

IR01-20221201-Bruntwood
IR02-20221205-Research
IR03-20221205-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:
MANCHESTER SCIENCE PARK,
MANCHESTER

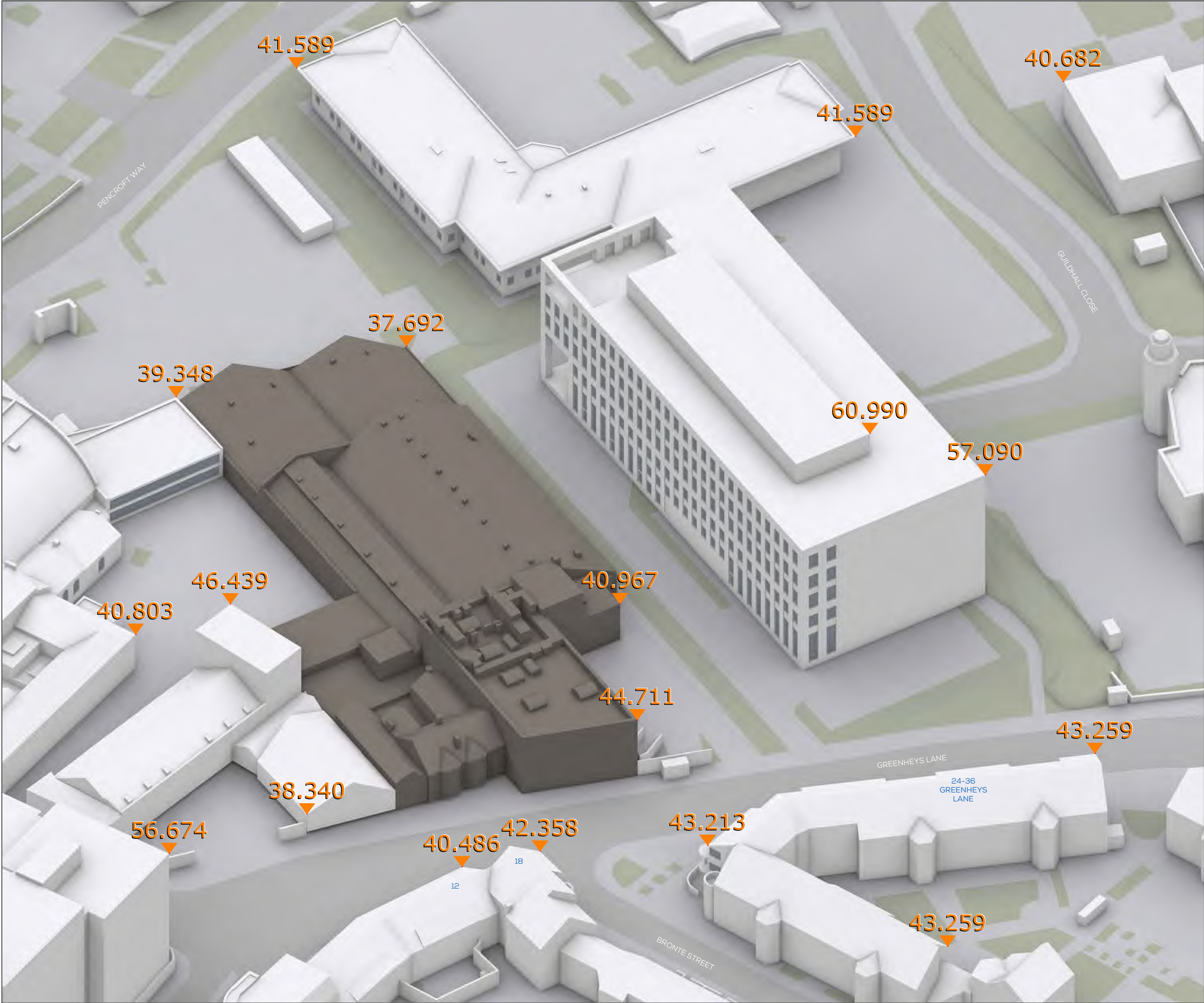
DRAWING NAME:
3D VIEW EXISTING

DWN BY	SCALE	CHK BY	STATUS	DATE
KS	NTS	SP	-	MAR23
PROJ No.	REL No.	IS No.	DWG No.	REV No.
2280	01	02	02	-



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

MANCHESTER • LONDON



SOURCES OF INFORMATION

IR01-20221201-Bruntwood
IR02-20221205-Research
IR03-20221205-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

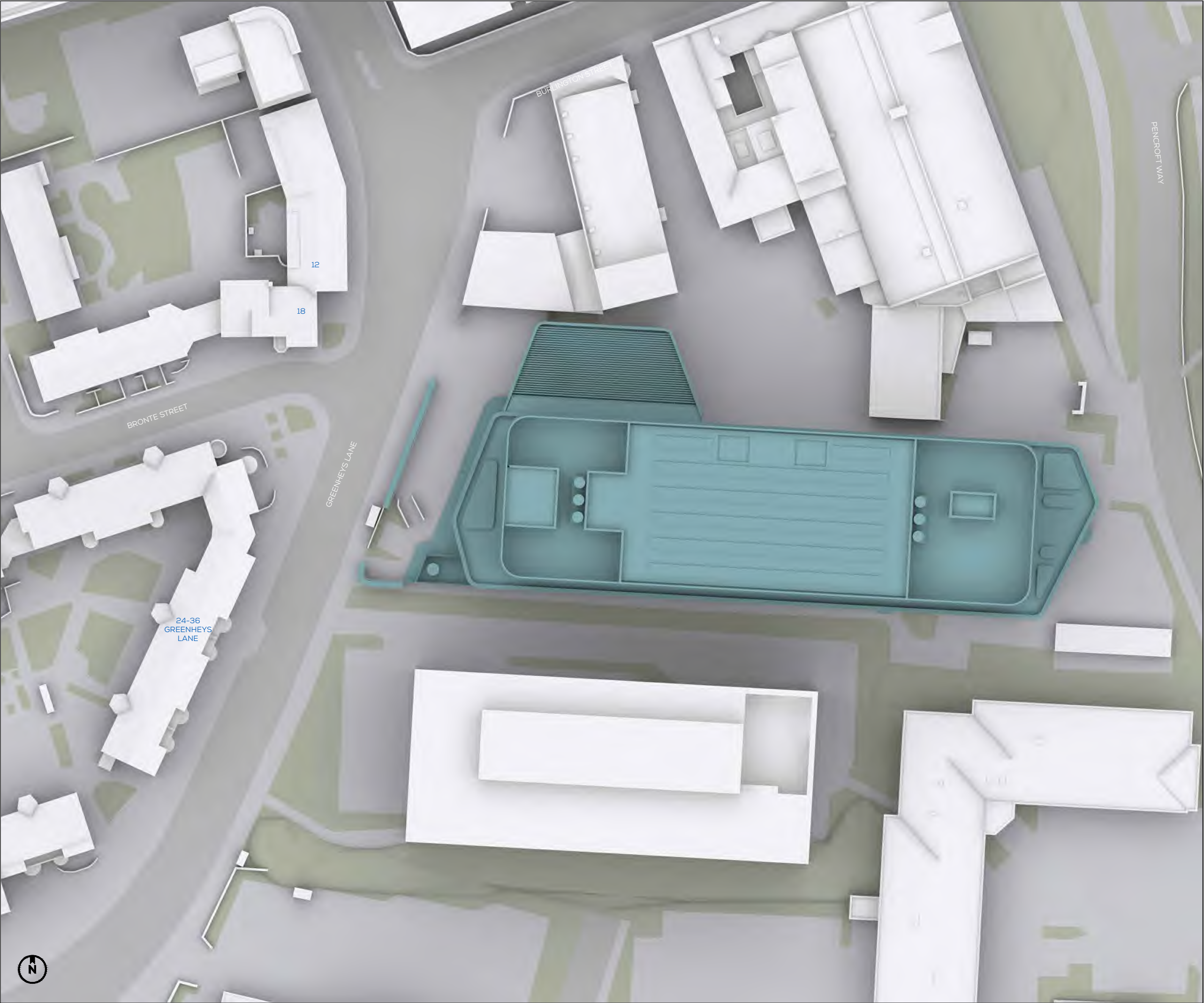
N.B. DO NOT SCALE OFF THIS DRAWING
PROJECT:
MANCHESTER SCIENCE PARK,
MANCHESTER

DRAWING NAME:
3D VIEW EXISTING

DWN BY	SCALE	CHK BY	STATUS	DATE
KS	NTS	SP	-	MAR23
PROJ No.	REL No.	IS No.	DWG No.	REV No.
2280	01	02	03	-

Appendix 03

Proposed Drawings



SOURCES OF INFORMATION

IR01-20221201-Bruntwood
IR02-20221205-Research
IR03-20221205-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:
PROPOSED SCHEME SHOWN IN TEAL

N.B. DO NOT SCALE OFF THIS DRAWING
PROJECT:
MANCHESTER SCIENCE PARK,
MANCHESTER

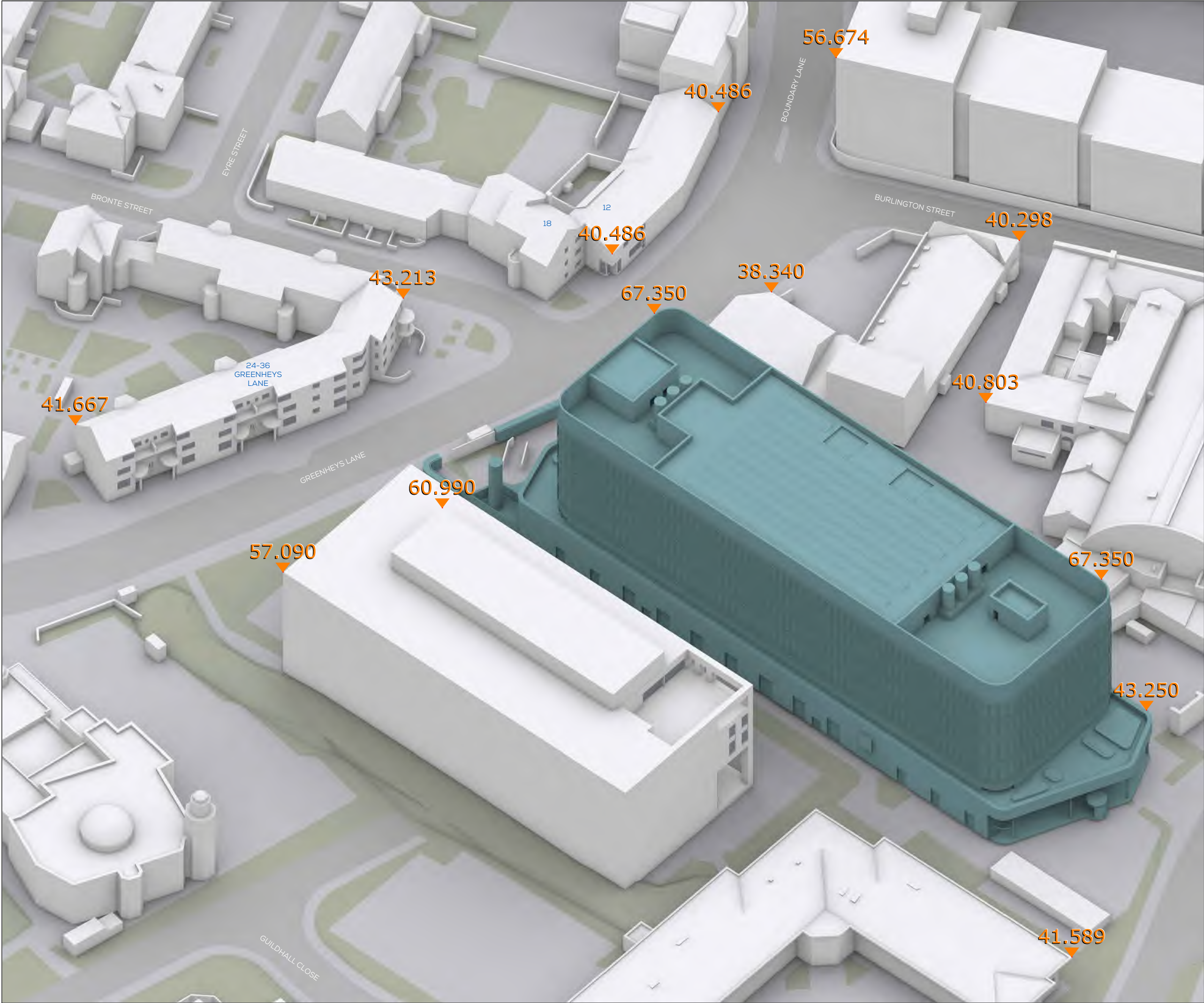
DRAWING NAME:
PLAN VIEW PROPOSED

DWN BY	SCALE	CHK BY	STATUS	DATE
KS	NTS	SP	-	MAR23
PROJ No.	REL No.	IS No.	DWG No.	REV No.
2280	01	02	04	-

gia

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

MANCHESTER • LONDON



SOURCES OF INFORMATION

IR01-20221201-Bruntwood
IR02-20221205-Research
IR03-20221205-Vertex

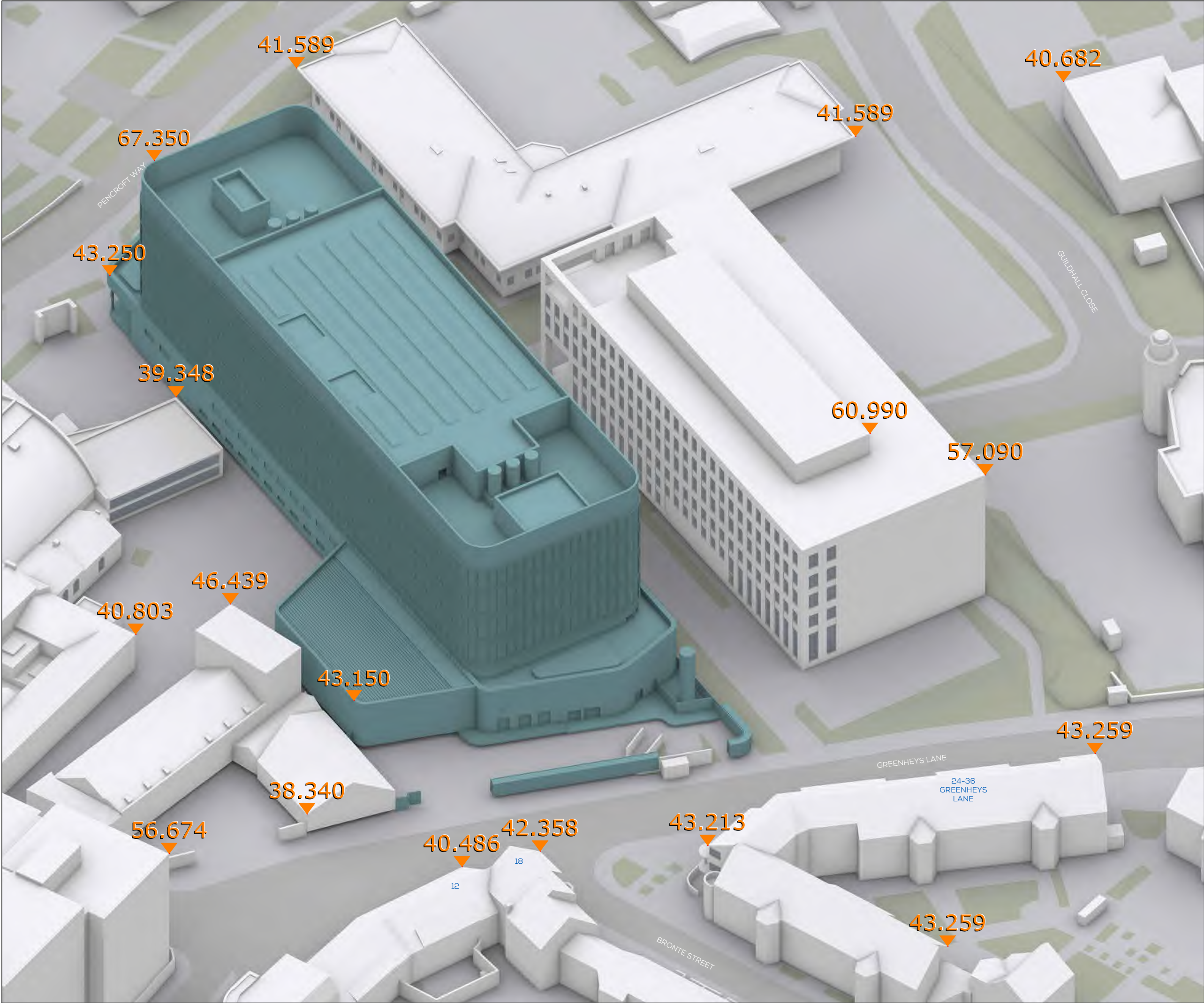
ALL INFORMATION DISPLAYED IS SUBJECT TO A COMPLETE VERIFIABLE SITE SURVEY BEING UNDERTAKEN. GIA TAKES NO RESPONSIBILITY ON THE ACCURACY OR RELIABILITY OF THE DISPLAYED DATA SINCE A VERIFIED SITE SURVEY WAS NOT MADE AVAILABLE PRIOR TO THE GENERATION OF SUCH INFORMATION.

NOTES:
PROPOSED SCHEME SHOWN IN TEAL

N.B. DO NOT SCALE OFF THIS DRAWING
PROJECT:
MANCHESTER SCIENCE PARK,
MANCHESTER

DRAWING NAME:
3D VIEW PROPOSED

DWN BY	SCALE	CHK BY	STATUS	DATE
KS	NTS	SP	-	MAR23
PROJ No.	REL No.	IS No.	DWG No.	REV No.
2280	01	02	05	-



SOURCES OF INFORMATION

IR01-20221201-Bruntwood
IR02-20221205-Research
IR03-20221205-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:
PROPOSED SCHEME SHOWN IN TEAL

N.B. DO NOT SCALE OFF THIS DRAWING
PROJECT:
MANCHESTER SCIENCE PARK,
MANCHESTER

DRAWING NAME:
3D VIEW PROPOSED

DWN BY	SCALE	CHK BY	STATUS	DATE
KS	NTS	SP	-	MAR23
PROJ No.	REL No.	IS No.	DWG No.	REV No.
2280	01	02	06	-

Appendix 04

Results and Window Maps

					VSC (WINDOW)					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
18 GREENHEYS LANE																					
F00	R2	RESIDENTIAL	UNKNOWN	W11/F00	21.7	18.3	3.4	15.7%	YES	96.6	91.7	0.6	5.1%	YES	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R3	RESIDENTIAL	UNKNOWN	W12/F00	28.5	25	3.5	12.3%	YES	94.2	79.1	1.9	16.1%	YES	N/A	N/A	N/A	N/A	N/A	N/A	N/A
F01	R1	RESIDENTIAL	UNKNOWN	W1/F01	25.3	21.3	4	15.8%	YES	97.8	94.2	0.5	3.7%	YES	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R2	RESIDENTIAL	UNKNOWN	W2/F01	32.5	28.4	4.1	12.6%	YES	96.2	82.3	1.8	14.5%	YES	N/A	N/A	N/A	N/A	N/A	N/A	N/A
F02	R1	RESIDENTIAL	UNKNOWN	W1/F02	32.7	28.5	4.2	12.8%	YES	99	97	0.3	2.0%	YES	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R2	RESIDENTIAL	UNKNOWN	W2/F02	35.9	31.5	4.4	12.3%	YES	96.6	84.7	1.5	12.3%	YES	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12 GREENHEYS LANE																					
F01	R1	RESIDENTIAL	UNKNOWN	W1/F01	34.7	30.9	3.8	11.0%	YES	99.7	99.7	0.0	0.0%	YES	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R2	RESIDENTIAL	UNKNOWN	W2/F01	34.8	30.8	4	11.5%	YES	99.9	99.9	0.0	0.0%	YES	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R3	RESIDENTIAL	UNKNOWN	W3/F01	34.9	30.7	4.2	12.0%	YES	99.4	99.4	0.0	0.0%	YES	N/A	N/A	N/A	N/A	N/A	N/A	N/A
24-36 GREENHEYS LANE																					
F00	R1	RESIDENTIAL	UNKNOWN	W1/F00	23.2	19.7	3.5	15.1%	YES	100	100	0.0	0.0%	YES	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			UNKNOWN	W21/F00	19.4	19.4	0	0.0%	YES												
			UNKNOWN	W22/F00	10.7	9.8	0.9	8.4%	YES												
	R2	RESIDENTIAL	UNKNOWN	W2/F00	30.3	26.7	3.6	11.9%	YES	97.6	96.3	0.1	1.3%	YES	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R3	RESIDENTIAL	UNKNOWN	W3/F00	31.7	27.8	3.9	12.3%	YES	99.8	98.6	0.1	1.1%	YES	40	8	33	8	17.5%	0.0%	YES
			UNKNOWN	W4/F00	19.7	18.3	1.4	7.1%	YES												
	R4	RESIDENTIAL	UNKNOWN	W5/F00	28.2	24.5	3.7	13.1%	YES	97.4	93.8	0.6	3.7%	YES	41	7	34	7	17.1%	0.0%	YES
			UNKNOWN	W23/F00	28.7	24.7	4	13.9%	YES												
	R5	RESIDENTIAL	UNKNOWN	W6/F00	21.6	19.5	2.1	9.7%	YES	99	98.8	0.0	0.2%	YES	56	15	51	15	8.9%	0.0%	YES
				UNKNOWN	W7/F00	30.8	27.4	3.4	11.0%	YES											
	R6	RESIDENTIAL	UNKNOWN	W8/F00	31	27.9	3.1	10.0%	YES	79.1	79.1	0.0	0.0%	YES	54	15	50	15	7.4%	0.0%	YES
	R7	RESIDENTIAL	UNKNOWN	W9/F00	30.4	27.4	3	9.9%	YES	94.2	94.2	0.0	0.0%	YES	49	10	45	10	8.2%	0.0%	YES
	R8	RESIDENTIAL	UNKNOWN	W10/F00	5.3	4.6	0.7	13.2%	YES	69.1	67.3	0.2	2.6%	YES	11	9	9	9	18.2%	0.0%	YES
	R9	RESIDENTIAL	UNKNOWN	W11/F00	20.8	19.6	1.2	5.8%	YES	55.6	55.6	0.0	0.0%	YES	38	8	34	8	10.5%	0.0%	YES
				UNKNOWN	W12/F00	20.9	19.5	1.4	6.7%	YES											
	R10	RESIDENTIAL	UNKNOWN	W13/F00	5.6	3.1	2.5	44.6%	NO	71.2	71.2	0.0	0.0%	YES	4	0	0	0	100.0%	0.0%	YES
	R11	RESIDENTIAL	UNKNOWN	W14/F00	31.2	28.9	2.3	7.4%	YES	95.4	94.4	0.2	1.0%	YES	56	18	52	18	7.1%	0.0%	YES
	R12	RESIDENTIAL	UNKNOWN	W15/F00	31.2	29.2	2	6.4%	YES	93.8	93.7	0.0	0.1%	YES	52	14	50	14	3.8%	0.0%	YES

					VSC (WINDOW)					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
24-36 GREENHEYS LANE (CONTINUED)																					
	R13	RESIDENTIAL	UNKNOWN	W16/F00	6	5.8	0.2	3.3%	YES	74.5	74.2	0.0	0.3%	YES	11	10	10	10	9.1%	0.0%	YES
	R14	RESIDENTIAL	UNKNOWN	W17/F00	21.9	21.1	0.8	3.7%	YES	82.1	82.1	0.0	0.0%	YES	36	9	35	9	2.8%	0.0%	YES
			UNKNOWN	W18/F00	22	21.2	0.8	3.6%	YES												
	R15	RESIDENTIAL	UNKNOWN	W19/F00	4.6	3.3	1.3	28.3%	NO	77.3	77.3	0.0	0.0%	YES	2	2	2	2	0.0%	0.0%	YES
	R16	RESIDENTIAL	UNKNOWN	W20/F00	32.8	31.6	1.2	3.7%	YES	99.7	99.7	0.0	0.0%	YES	56	21	56	21	0.0%	0.0%	YES
F01	R1	RESIDENTIAL	UNKNOWN	W1/F01	25.8	21.8	4	15.5%	YES	100	100	0.0	0.0%	YES	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			UNKNOWN	W30/F01	25.2	25.2	0	0.0%	YES												
			UNKNOWN	W31/F01	17.6	15.9	1.7	9.7%	YES												
			UNKNOWN	W32/F01	14.3	12.7	1.6	11.2%	YES												
			UNKNOWN	W33/F01	12.7	10.4	2.3	18.1%	YES												
	R2	RESIDENTIAL	UNKNOWN	W2/F01	33.3	29.2	4.1	12.3%	YES	97.8	96.7	0.1	1.2%	YES	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	R3	RESIDENTIAL	UNKNOWN	W3/F01	33.9	29.6	4.3	12.7%	YES	99.8	98.8	0.1	1.0%	YES	44	10	36	10	18.2%	0.0%	YES
			UNKNOWN	W4/F01	21.3	19.9	1.4	6.6%	YES												
	R4	RESIDENTIAL	UNKNOWN	W5/F01	32	27.5	4.5	14.1%	YES	99.9	99.9	0.0	0.0%	YES	47	10	41	10	12.8%	0.0%	YES
			UNKNOWN	W6/F01	31	27	4	12.9%	YES												
	R5	RESIDENTIAL	UNKNOWN	W7/F01	23.1	20.7	2.4	10.4%	YES	98.9	98.7	0.0	0.2%	YES	57	15	53	15	7.0%	0.0%	YES
			UNKNOWN	W8/F01	32.7	29.1	3.6	11.0%	YES												
	R6	RESIDENTIAL	UNKNOWN	W9/F01	32.7	29.5	3.2	9.8%	YES	82.6	82.6	0.0	0.0%	YES	57	16	53	16	7.0%	0.0%	YES
	R7	RESIDENTIAL	UNKNOWN	W10/F01	32.8	29.8	3	9.1%	YES	98.7	98.7	0.0	0.0%	YES	59	18	55	18	6.8%	0.0%	YES
			UNKNOWN	W11/F01	11	11	0	0.0%	YES												
			UNKNOWN	W12/F01	7.4	7.4	0	0.0%	YES												
	R8	RESIDENTIAL	UNKNOWN	W13/F01	7.1	6	1.1	15.5%	YES	89	87.8	0.2	1.4%	YES	14	6	10	6	28.6%	0.0%	YES
			UNKNOWN	W14/F01	8.7	6.6	2.1	24.1%	NO												
	R9	RESIDENTIAL	UNKNOWN	W15/F01	8.7	6.6	2.1	24.1%	NO	89.7	87.1	0.4	2.9%	YES	14	6	9	6	35.7%	0.0%	NO
			UNKNOWN	W16/F01	6.7	4.9	1.8	26.9%	NO												
	R10	RESIDENTIAL	UNKNOWN	W17/F01	10.4	8	2.4	23.1%	NO	98.6	95.9	0.6	2.7%	YES	58	18	54	18	6.9%	0.0%	YES
			UNKNOWN	W18/F01	6.8	4.4	2.4	35.3%	NO												
			UNKNOWN	W19/F01	33.2	30.9	2.3	6.9%	YES												
	R11	RESIDENTIAL	UNKNOWN	W20/F01	33.5	31.5	2	6.0%	YES	94.8	94.5	0.0	0.3%	YES	58	19	56	19	3.4%	0.0%	YES
			UNKNOWN	W21/F01	11.6	11.6	0	0.0%	YES												
			UNKNOWN	W22/F01	8	8	0	0.0%	YES												

					VSC (WINDOW)					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	
24-36 GREENHEYS LANE (CONTINUED)																						
	R12	RESIDENTIAL	UNKNOWN	W23/F01	7.7	7.5	0.2	2.6%	YES	87.6	87	0.1	0.7%	YES	14	7	13	7	7.1%	0.0%	YES	
			UNKNOWN	W24/F01	9.5	8.3	1.2	12.6%	YES													
	R13	RESIDENTIAL	UNKNOWN	W25/F01	9.6	8.3	1.3	13.5%	YES	88.5	82.4	1.0	6.9%	YES	14	9	13	9	7.1%	0.0%	YES	
			UNKNOWN	W26/F01	7.6	6.6	1	13.2%	YES													
	R14	RESIDENTIAL	UNKNOWN	W27/F01	9.6	7.8	1.8	18.8%	YES	99.6	99.6	0.0	0.0%	YES	57	21	57	21	0.0%	0.0%	YES	
			UNKNOWN	W28/F01	6	4.2	1.8	30.0%	NO													
			UNKNOWN	W29/F01	34.6	33.5	1.1	3.2%	YES													
F02	R1	RESIDENTIAL	UNKNOWN	W1/F02	36	31.6	4.4	12.2%	YES	100	100	0.0	0.0%	YES	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
			UNKNOWN	W34/F02	33	33	0	0.0%	YES													
			UNKNOWN	W35/F02	35.9	31.9	4	11.1%	YES													
			UNKNOWN	W36/F02	35.9	31.8	4.1	11.4%	YES													
			UNKNOWN	W37/F02	35.9	31.8	4.1	11.4%	YES													
	R2	RESIDENTIAL	UNKNOWN	W2/F02	35.9	31.5	4.4	12.3%	YES	97.9	97.1	0.1	0.8%	YES	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	R3	RESIDENTIAL	UNKNOWN	W3/F02	35.8	31	4.8	13.4%	YES	99.9	98.9	0.1	1.0%	YES	53	11	46	11	13.2%	0.0%	YES	
			UNKNOWN	W4/F02	25.3	24	1.3	5.1%	YES													
	R4	RESIDENTIAL	UNKNOWN	W5/F02	35.4	30.7	4.7	13.3%	YES	100	100	0.0	0.0%	YES	58	15	53	15	8.6%	0.0%	YES	
			UNKNOWN	W6/F02	34.2	30.1	4.1	12.0%	YES													
	R5	RESIDENTIAL	UNKNOWN	W7/F02	26.6	23.9	2.7	10.2%	YES	99.8	99.6	0.0	0.2%	YES	60	17	56	17	6.7%	0.0%	YES	
			UNKNOWN	W8/F02	34.3	30.7	3.6	10.5%	YES													
	R6	RESIDENTIAL	UNKNOWN	W9/F02	34.3	31	3.3	9.6%	YES	90.2	90.2	0.0	0.0%	YES	60	17	55	17	8.3%	0.0%	YES	
	R7	RESIDENTIAL	UNKNOWN	W10/F02	34.3	31.4	2.9	8.5%	YES	98.8	98.8	0.0	0.0%	YES	72	20	67	20	6.9%	0.0%	YES	
			UNKNOWN	W11/F02	24.9	24.9	0	0.0%	YES													
			UNKNOWN	W12/F02	28.2	28.2	0	0.0%	YES													
			UNKNOWN	W13/F02	22.1	22.1	0	0.0%	YES													
	R8	RESIDENTIAL	UNKNOWN	W14/F02	30.7	29.3	1.4	4.6%	YES	96.5	96.5	0.0	0.0%	YES	60	18	55	18	8.3%	0.0%	YES	
			UNKNOWN	W15/F02	33.7	31.2	2.5	7.4%	YES													
	R9	RESIDENTIAL	UNKNOWN	W16/F02	33.7	31.2	2.5	7.4%	YES	97	96.9	0.0	0.1%	YES	55	14	50	14	9.1%	0.0%	YES	
			UNKNOWN	W17/F02	30.2	27.9	2.3	7.6%	YES													
	R10	RESIDENTIAL	UNKNOWN	W18/F02	24.5	22.1	2.4	9.8%	YES	97.9	95.3	0.5	2.6%	YES	59	18	55	18	6.8%	0.0%	YES	
			UNKNOWN	W19/F02	27.7	25.3	2.4	8.7%	YES													
			UNKNOWN	W20/F02	21.7	19.3	2.4	11.1%	YES													

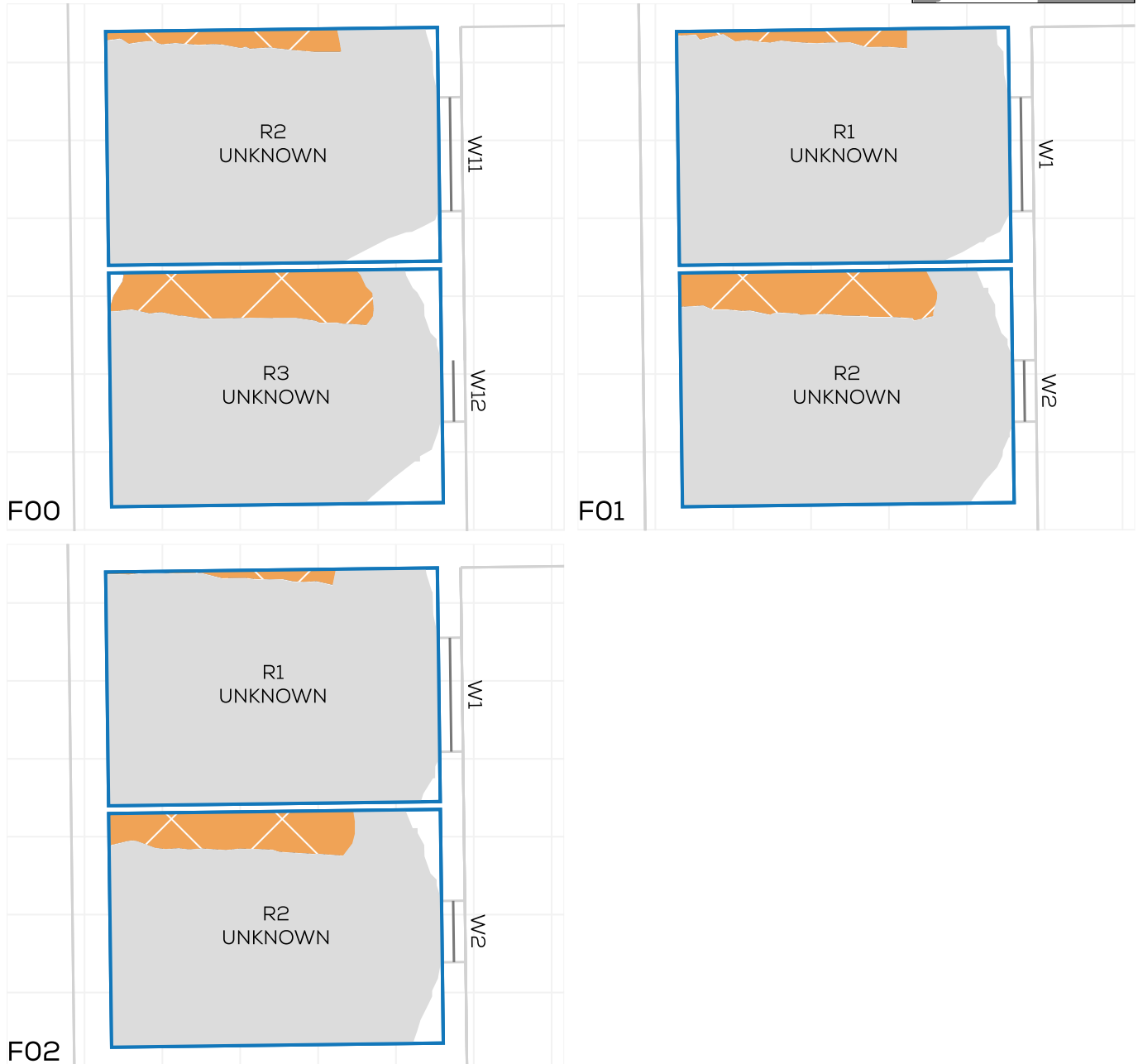
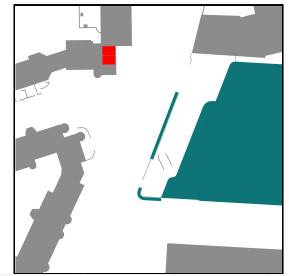
					VSC (WINDOW)					NSL					APSH (ROOM)						
FLOOR	ROOM	PROPERTY	ROOM	WINDOW	EX.	PR.	LOSS	LOSS	MEETS	EX.	PR.	LOSS	LOSS	MEETS	EX.		PR.		LOSS %		MEETS
		TYPE	USE		%	%		%	CRITERIA	%	%	SQM	%	CRITERIA	ANNUAL	WINTER	ANNUAL	WINTER	ANNUAL	WINTER	CRITERIA
24-36 GREENHEYS LANE (CONTINUED)																					
			UNKNOWN	W21/F02	34.6	32.3	2.3	6.6%	YES												
	R11	RESIDENTIAL	UNKNOWN	W22/F02	34.8	33	1.8	5.2%	YES	99.1	99.1	0.0	0.0%	YES	70	21	69	21	1.4%	0.0%	YES
			UNKNOWN	W23/F02	25.4	25.4	0	0.0%	YES												
			UNKNOWN	W24/F02	28.8	28.8	0	0.0%	YES												
			UNKNOWN	W25/F02	22.6	22.6	0	0.0%	YES												
	R12	RESIDENTIAL	UNKNOWN	W26/F02	31.3	30.9	0.4	1.3%	YES	95.6	95.6	0.0	0.0%	YES	58	19	57	19	1.7%	0.0%	YES
			UNKNOWN	W27/F02	34.4	33	1.4	4.1%	YES												
	R13	RESIDENTIAL	UNKNOWN	W28/F02	34.4	33	1.4	4.1%	YES	96.9	96.9	0.0	0.1%	YES	56	17	55	17	1.8%	0.0%	YES
			UNKNOWN	W29/F02	31	29.7	1.3	4.2%	YES												
	R14	RESIDENTIAL	UNKNOWN	W30/F02	23.7	21.9	1.8	7.6%	YES	99.1	96.6	0.3	2.5%	YES	60	21	59	21	1.7%	0.0%	YES
			UNKNOWN	W31/F02	26.9	25.2	1.7	6.3%	YES												
			UNKNOWN	W32/F02	20.9	19.2	1.7	8.1%	YES												
			UNKNOWN	W33/F02	35.7	34.5	1.2	3.4%	YES												

NSL CONTOURS



PROJECT: 2280 - MANCHESTER SCIENCE PARK, M
 REPORT TITLE: EXISTING VS. PROPOSED
 ADDRESS: 18 GREENHEYS LANE
 DATE: 14/03/2023
 SCHEME IR: IR04
 DRAWING No.: 2280-REL01-IS02-NSL1

KEY:
 GAIN
 LOSS
 MAINTAINED LIT AREA
 1 METRE GRID

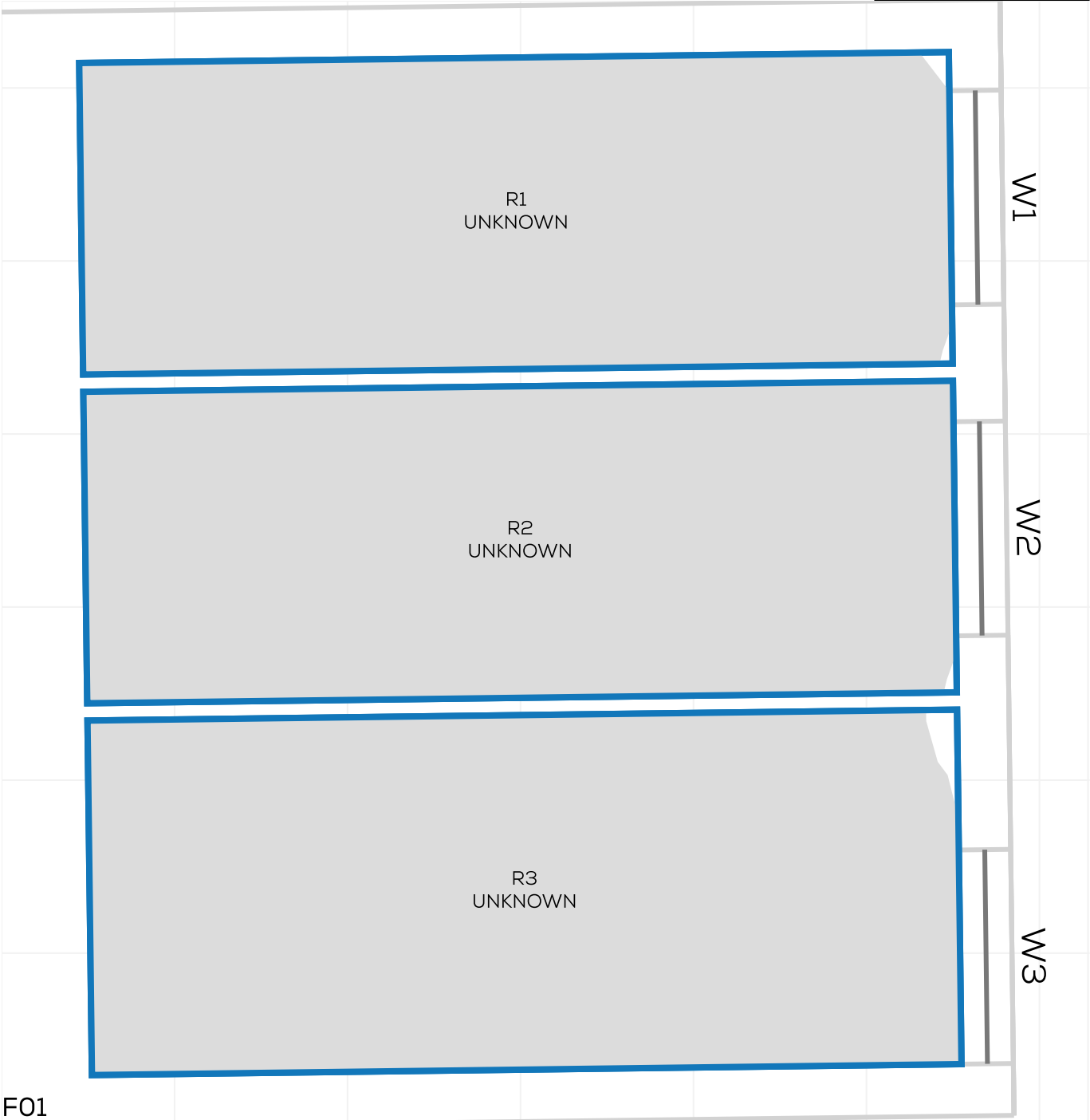
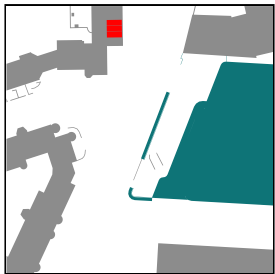


FLOOR	ROOM	PROPERTY TYPE	ROOM USE	ROOM AREA-sqm	EXISTING %	PROPOSED %	LOSS-sqm	LOSS %
18 GREENHEYS LANE								
F00	R2	RESIDENTIAL	UNKNOWN	12.8	96.6	91.7	0.6	5.1
F00	R3	RESIDENTIAL	UNKNOWN	12.8	94.2	79.1	1.9	16.1
F01	R1	RESIDENTIAL	UNKNOWN	12.8	97.8	94.2	0.5	3.7
F01	R2	RESIDENTIAL	UNKNOWN	12.8	96.2	82.3	1.8	14.5
F02	R1	RESIDENTIAL	UNKNOWN	12.8	99	97	0.3	2
F02	R2	RESIDENTIAL	UNKNOWN	12.8	96.6	84.7	1.5	12.3

PROJECT: 2280 - MANCHESTER SCIENCE PARK, M
 REPORT TITLE: EXISTING VS. PROPOSED
 ADDRESS: 12 GREENHEYS LANE
 DATE: 14/03/2023
 SCHEME IR: IR04
 DRAWING No.: 2280-REL01-IS02-NSL2

KEY:

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



F01

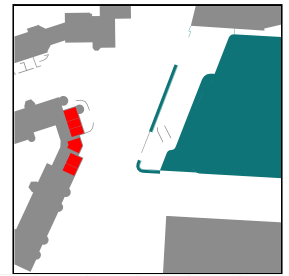
FLOOR	ROOM	PROPERTY TYPE	ROOM USE	ROOM AREA-sqm	EXISTING %	PROPOSED %	LOSS-sqm	LOSS %
12 GREENHEYS LANE								
F01	R1	RESIDENTIAL	UNKNOWN	9.0	99.7	99.7	0.0	0
F01	R2	RESIDENTIAL	UNKNOWN	9.0	99.9	99.9	0.0	0
F01	R3	RESIDENTIAL	UNKNOWN	10.3	99.4	99.4	0.0	0

NSL CONTOURS



PROJECT: 2280 - MANCHESTER SCIENCE PARK, M
 REPORT TITLE: EXISTING VS. PROPOSED
 ADDRESS: 24-36 GREENHEYS LANE
 DATE: 14/03/2023
 SCHEME IR: IR04
 DRAWING No.: 2280-REL01-IS02-NSL3

KEY:
 GAIN
 LOSS
 MAINTAINED LIT AREA
 1 METRE GRID



F00

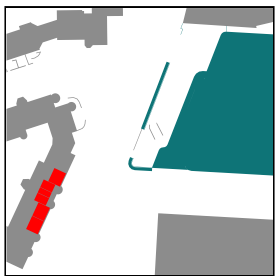
FLOOR	ROOM	PROPERTY TYPE	ROOM USE	ROOM AREA-sqm	EXISTING %	PROPOSED %	LOSS-sqm	LOSS %
24-36 GREENHEYS LANE								
F00	R1	RESIDENTIAL	UNKNOWN	15.8	100	100	0.0	0
F00	R2	RESIDENTIAL	UNKNOWN	11.1	97.6	96.3	0.1	1.3
F00	R3	RESIDENTIAL	UNKNOWN	11.1	99.8	98.6	0.1	1.1
F00	R4	RESIDENTIAL	UNKNOWN	16.5	97.4	93.8	0.6	3.7
F00	R5	RESIDENTIAL	UNKNOWN	15.8	99	98.8	0.0	0.2
F00	R6	RESIDENTIAL	UNKNOWN	11.1	79.1	79.1	0.0	0

NSL CONTOURS



PROJECT: 2280 - MANCHESTER SCIENCE PARK, M
 REPORT TITLE: EXISTING VS. PROPOSED
 ADDRESS: 24-36 GREENHEYS LANE
 DATE: 14/03/2023
 SCHEME IR: IR04
 DRAWING No.: 2280-REL01-IS02-NSL4

KEY:
 GAIN
 LOSS
 MAINTAINED LIT AREA
 1 METRE GRID



F00

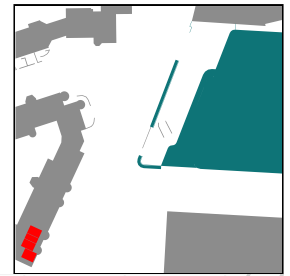
FLOOR	ROOM	PROPERTY TYPE	ROOM USE	ROOM AREA-sqm	EXISTING %	PROPOSED %	LOSS-sqm	LOSS %
24-36 GREENHEYS LANE								
F00	R7	RESIDENTIAL	UNKNOWN	20.7	94.2	94.2	0.0	0
F00	R8	RESIDENTIAL	UNKNOWN	11.9	69.1	67.3	0.2	2.6
F00	R9	RESIDENTIAL	UNKNOWN	8.1	55.6	55.6	0.0	0
F00	R10	RESIDENTIAL	UNKNOWN	11.5	71.2	71.2	0.0	0
F00	R11	RESIDENTIAL	UNKNOWN	20.6	95.4	94.4	0.2	1
F00	R12	RESIDENTIAL	UNKNOWN	20.5	93.8	93.7	0.0	0.1

NSL CONTOURS



PROJECT: 2280 - MANCHESTER SCIENCE PARK, M
 REPORT TITLE: EXISTING VS. PROPOSED
 ADDRESS: 24-36 GREENHEYS LANE
 DATE: 14/03/2023
 SCHEME IR: IR04
 DRAWING No.: 2280-REL01-IS02-NSL5

KEY:
 GAIN
 LOSS
 MAINTAINED LIT AREA
 1 METRE GRID



F00

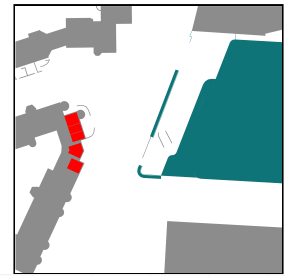
FLOOR	ROOM	PROPERTY TYPE	ROOM USE	ROOM AREA-sqm	EXISTING %	PROPOSED %	LOSS-sqm	LOSS %
24-36 GREENHEYS LANE								
F00	R13	RESIDENTIAL	UNKNOWN	11.9	74.5	74.2	0.0	0.3
F00	R14	RESIDENTIAL	UNKNOWN	8.1	82.1	82.1	0.0	0
F00	R15	RESIDENTIAL	UNKNOWN	11.5	77.3	77.3	0.0	0
F00	R16	RESIDENTIAL	UNKNOWN	13.8	99.7	99.7	0.0	0

NSL CONTOURS



PROJECT: 2280 - MANCHESTER SCIENCE PARK, M
 REPORT TITLE: EXISTING VS. PROPOSED
 ADDRESS: 24-36 GREENHEYS LANE
 DATE: 14/03/2023
 SCHEME IR: IR04
 DRAWING No.: 2280-REL01-IS02-NSL6

KEY:
 GAIN
 LOSS
 MAINTAINED LIT AREA
 1 METRE GRID



F01

FLOOR	ROOM	PROPERTY TYPE	ROOM USE	ROOM AREA-sqm	EXISTING %	PROPOSED %	LOSS-sqm	LOSS %
24-36 GREENHEYS LANE								
F01	R1	RESIDENTIAL	UNKNOWN	15.8	100	100	0.0	0
F01	R2	RESIDENTIAL	UNKNOWN	11.1	97.8	96.7	0.1	1.2
F01	R3	RESIDENTIAL	UNKNOWN	11.1	99.8	98.8	0.1	1
F01	R4	RESIDENTIAL	UNKNOWN	16.5	99.9	99.9	0.0	0
F01	R5	RESIDENTIAL	UNKNOWN	15.8	98.9	98.7	0.0	0.2

NSL CONTOURS



PROJECT: 2280 - MANCHESTER SCIENCE PARK, M
REPORT TITLE: EXISTING VS. PROPOSED
ADDRESS: 24-36 GREENHEYS LANE
DATE: 14/03/2023
SCHEME IR: IR04
DRAWING No.: 2280-REL01-IS02-NSL7

KEY:

GAIN

LOSS

MAINTAINED LIT AREA

1 METRE GRID



F01

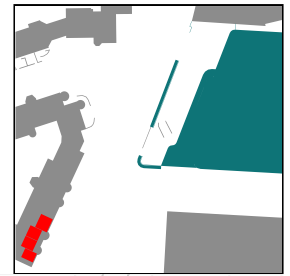
FLOOR	ROOM	PROPERTY TYPE	ROOM USE	ROOM AREA-sqm	EXISTING %	PROPOSED %	LOSS-sqm	LOSS %
24-36 GREENHEYS LANE								
F01	R6	RESIDENTIAL	UNKNOWN	11.1	82.6	82.6	0.0	0
F01	R7	RESIDENTIAL	UNKNOWN	20.7	98.7	98.7	0.0	0
F01	R8	RESIDENTIAL	UNKNOWN	16.1	89	87.8	0.2	1.4
F01	R9	RESIDENTIAL	UNKNOWN	15.8	89.7	87.1	0.4	2.9
F01	R10	RESIDENTIAL	UNKNOWN	20.6	98.6	95.9	0.6	2.7

NSL CONTOURS



PROJECT: 2280 - MANCHESTER SCIENCE PARK, M
 REPORT TITLE: EXISTING VS. PROPOSED
 ADDRESS: 24-36 GREENHEYS LANE
 DATE: 14/03/2023
 SCHEME IR: IR04
 DRAWING No.: 2280-REL01-IS02-NSL8

KEY:
 GAIN
 LOSS
 MAINTAINED LIT AREA
 1 METRE GRID



F01

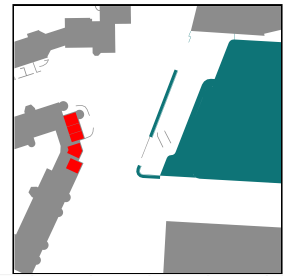
FLOOR	ROOM	PROPERTY TYPE	ROOM USE	ROOM AREA-sqm	EXISTING %	PROPOSED %	LOSS-sqm	LOSS %
24-36 GREENHEYS LANE								
F01	R11	RESIDENTIAL	UNKNOWN	20.5	94.8	94.5	0.0	0.3
F01	R12	RESIDENTIAL	UNKNOWN	16.1	87.6	87	0.1	0.7
F01	R13	RESIDENTIAL	UNKNOWN	15.8	88.5	82.4	1.0	6.9
F01	R14	RESIDENTIAL	UNKNOWN	13.8	99.6	99.6	0.0	0

NSL CONTOURS



PROJECT: 2280 - MANCHESTER SCIENCE PARK, M
 REPORT TITLE: EXISTING VS. PROPOSED
 ADDRESS: 24-36 GREENHEYS LANE
 DATE: 14/03/2023
 SCHEME IR: IR04
 DRAWING No.: 2280-REL01-IS02-NSL9

KEY:
 GAIN
 LOSS
 MAINTAINED LIT AREA
 1 METRE GRID



F02

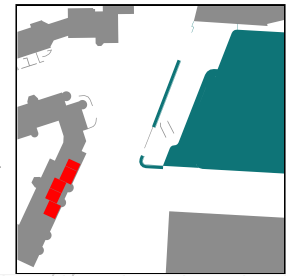
FLOOR	ROOM	PROPERTY TYPE	ROOM USE	ROOM AREA-sqm	EXISTING %	PROPOSED %	LOSS-sqm	LOSS %
24-36 GREENHEYS LANE								
F02	R1	RESIDENTIAL	UNKNOWN	15.8	100	100	0.0	0
F02	R2	RESIDENTIAL	UNKNOWN	11.1	97.9	97.1	0.1	0.8
F02	R3	RESIDENTIAL	UNKNOWN	11.1	99.9	98.9	0.1	1
F02	R4	RESIDENTIAL	UNKNOWN	16.5	100	100	0.0	0
F02	R5	RESIDENTIAL	UNKNOWN	15.8	99.8	99.6	0.0	0.2

NSL CONTOURS



PROJECT: 2280 - MANCHESTER SCIENCE PARK, M
REPORT TITLE: EXISTING VS. PROPOSED
ADDRESS: 24-36 GREENHEYS LANE
DATE: 14/03/2023
SCHEME IR: IR04
DRAWING No.: 2280-REL01-IS02-NSL10

KEY:
 GAIN
 LOSS
 MAINTAINED LIT AREA
 1 METRE GRID



F02

FLOOR	ROOM	PROPERTY TYPE	ROOM USE	ROOM AREA-sqm	EXISTING %	PROPOSED %	LOSS-sqm	LOSS %
24-36 GREENHEYS LANE								
F02	R6	RESIDENTIAL	UNKNOWN	11.1	90.2	90.2	0.0	0
F02	R7	RESIDENTIAL	UNKNOWN	20.7	98.8	98.8	0.0	0
F02	R8	RESIDENTIAL	UNKNOWN	16.1	96.5	96.5	0.0	0
F02	R9	RESIDENTIAL	UNKNOWN	15.8	97	96.9	0.0	0.1
F02	R10	RESIDENTIAL	UNKNOWN	20.6	97.9	95.3	0.5	2.6

PROJECT: 2280 - MANCHESTER SCIENCE PARK, M
REPORT TITLE: EXISTING VS. PROPOSED
ADDRESS: 24-36 GREENHEYS LANE
DATE: 14/03/2023
SCHEME IR: IR04
DRAWING No.: 2280-REL01-IS02-NSL11

KEY:

GAIN

LOSS

MAINTAINED LIT AREA

1 METRE GRID



F02

FLOOR	ROOM	PROPERTY TYPE	ROOM USE	ROOM AREA-sqm	EXISTING %	PROPOSED %	LOSS-sqm	LOSS %
24-36 GREENHEYS LANE								
F02	R11	RESIDENTIAL	UNKNOWN	20.5	99.1	99.1	0.0	0
F02	R12	RESIDENTIAL	UNKNOWN	16.1	95.6	95.6	0.0	0
F02	R13	RESIDENTIAL	UNKNOWN	15.8	96.9	96.9	0.0	0.1
F02	R14	RESIDENTIAL	UNKNOWN	13.8	99.1	96.6	0.3	2.5



For further details please contact us on:

LONDON

T 020 7202 1400

E mail@gia.uk.com

The Whitehouse
Belvedere Road
London SE1 8GA

MANCHESTER

T 0161 672 5100

E manchester@gia.uk.com

2 Commercial Street
Manchester
M15 4RQ

BELFAST

T 02892 449 674

E belfast@gia.uk.com

River House
48-60 High Street
Belfast BT1 2BE

BRISTOL

T 0117 374 1504

E bristol@gia.uk.com

33 Bristol
Colston Avenue
Bristol BS1 4UA

DUBLIN

T 020 7202 1400

E hello@giasurveyors.ie

77 Lower Camden Street
Dublin Ireland
D02 XE80