gia CHARTERED SURVEYORS

DAYLIGHT, SUNLIGHT & SUN HOURS ON GROUND

IMPACT ON NEIGHBOURING PROPERTIES REPORT

The Joint, Field and Leeke Street

CBRE Global Investors

03 February 2022

GIA No: **17319** Fee Quote: **FQ0003464**

PROJECT DATA:

Client	**CBRE Global Investors**
Architect	**Orbit Architects**
Project Title	**The Joint, Field and Leeke Street**
Project Number	**17319**

REPORT DATA:

Report Title	**Impact on Neighbouring Properties**
GIA Department	**Daylight & Sunlight**
Dated	**03 February 2022**
Fee Quote	**Fee Proposal No. 01**
Prepared by	**EG**
Checked by	**EG**
Type	**Final**

Revisions	No:	Date:	Notes:	Signed:

SOURCES OF INFORMATION:

Information Received	**IR08, IR09, IR10, IR11, IR23, IR24 and IR32**
Release Number	**Rel_06_17319_CAD**
Issue Number	**01**
Site Photos	**Google**
3D models	**VU.CITY & Murphy Surveys**
OS Data	**FIND Maps**

DISCLAIMER:

This report has been prepared for CBRE Global Investors by GIA as their appointed Daylight & Sunlight consultants. It is accurate as at the time of publication and based upon the information we have been provided with as set out in the report. It does not take into account changes that have taken place since the report was written nor does it take into account private information on internal layouts and room uses of adjoining properties unless this information is publicly available.

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APPENDICES (BOUND SEPARATELY)

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gia CHARTERED SURVEYORS

1 EXECUTIVE SUMMARY

GIA have assessed the proposed Orbit Architects scheme "proposed development" for the The Joint, Field and Leeke Street site to understand the potential changes in light to the relevant surrounding properties.

1.1 GIA have been instructed by CBRE Global Investors to provide daylight and sunlight advice in relation to the The Joint, Field and Leeke Street development.

1.2 GIA have undertaken a technical daylight,sunlight and Sun Hours on Ground (SHOG) assessment of the architect's scheme at The Joint "the site" to understand the potential effect of the development on the daylight and sunlight amenity of the relevant neighbouring properties. The requirement in London boroughs for significantly more living and working spaces necessitates higher density development. The Site is located within the London borough of Camden.

1.3 The daylight and sunlight analysis has been considered by reference to the criteria and methodology within the Building Research Establishment Guidelines (2011), which when published, recognised that it should not form a mandatory set of criteria, rather it should be used to help and inform design.

1.4 The daylight, sunlight and SHOG analysis has been considered by reference to the criteria and methodology within the Building Research Establishment Guidelines (2011), which when published, recognised that it should not form a mandatory set of criteria, rather it should be used to help and inform design.

1.5 Upon successful completion of the proposed scheme all windows and rooms tested for daylight and sunlight (100%) will meet the national numerical values identified in paragraph 3.2.11 of the BRE Guide.

1.6 GIA assessed five gardens and all would achieve BRE compliance for SHOG.

1.7 It can be concluded that there is a 100% compliance rate in relation to daylight, sunlight and SHOG following the implementation of the proposed development.

Figure 01: The Site and surrounding area

2 THE SITE

GIA have been instructed to review and advise on the daylight and sunlight impacts associated with the implementation of the proposed development at The Joint, Field and Leeke Street.

THE SITE

2.1 The Site is located in the London borough of Camden.

2.2 Figure 02 below illustrates the Site. Further drawings are enclosed at Appendix 03 of this report.

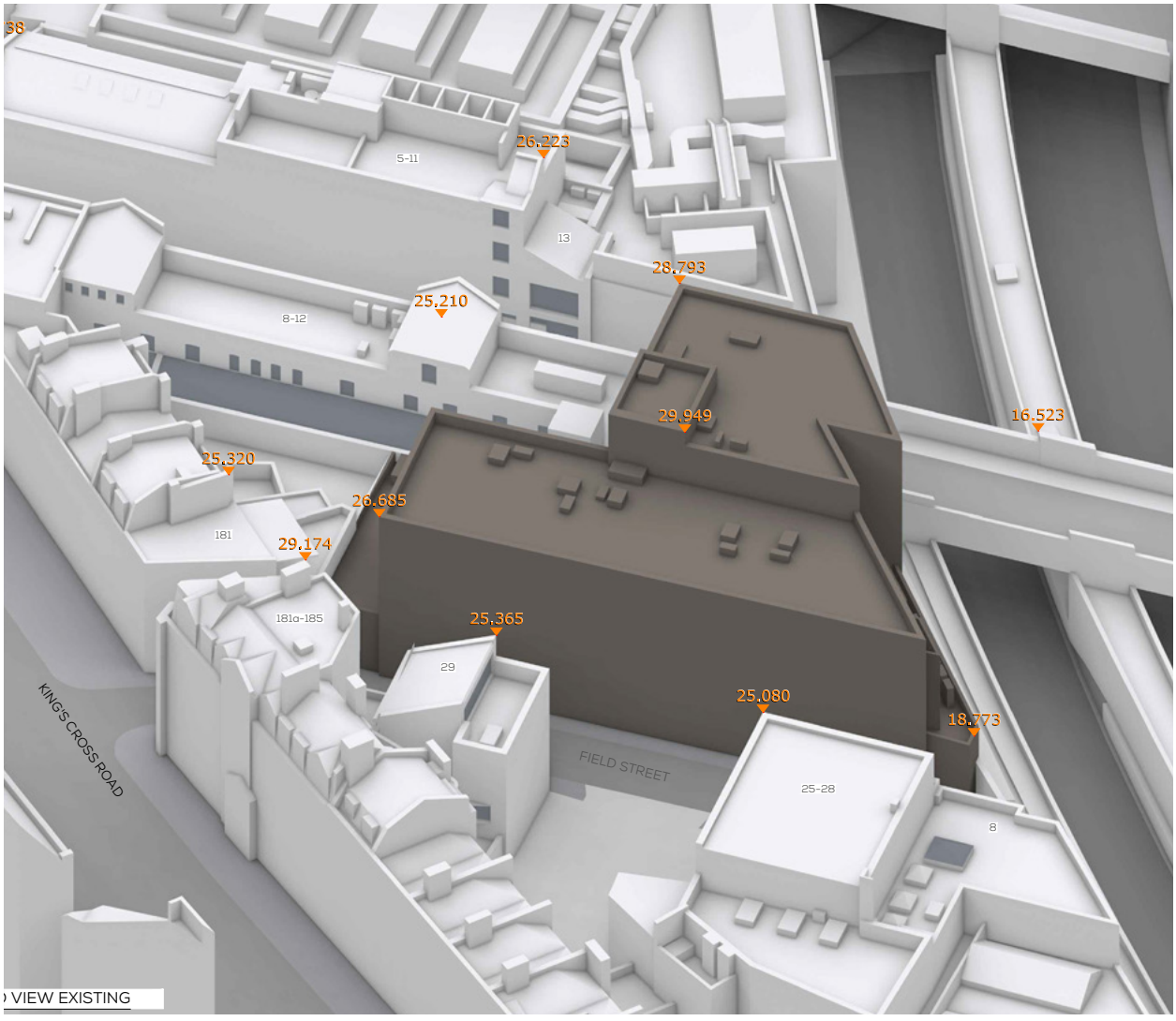

Figure 02: 3D model of the site and Existing Property

PROPOSED DEVELOPMENT

2.3 GIA's understanding of the Proposed Development is illustrated in Figure 03 and further drawings are enclosed at Appendix 03.

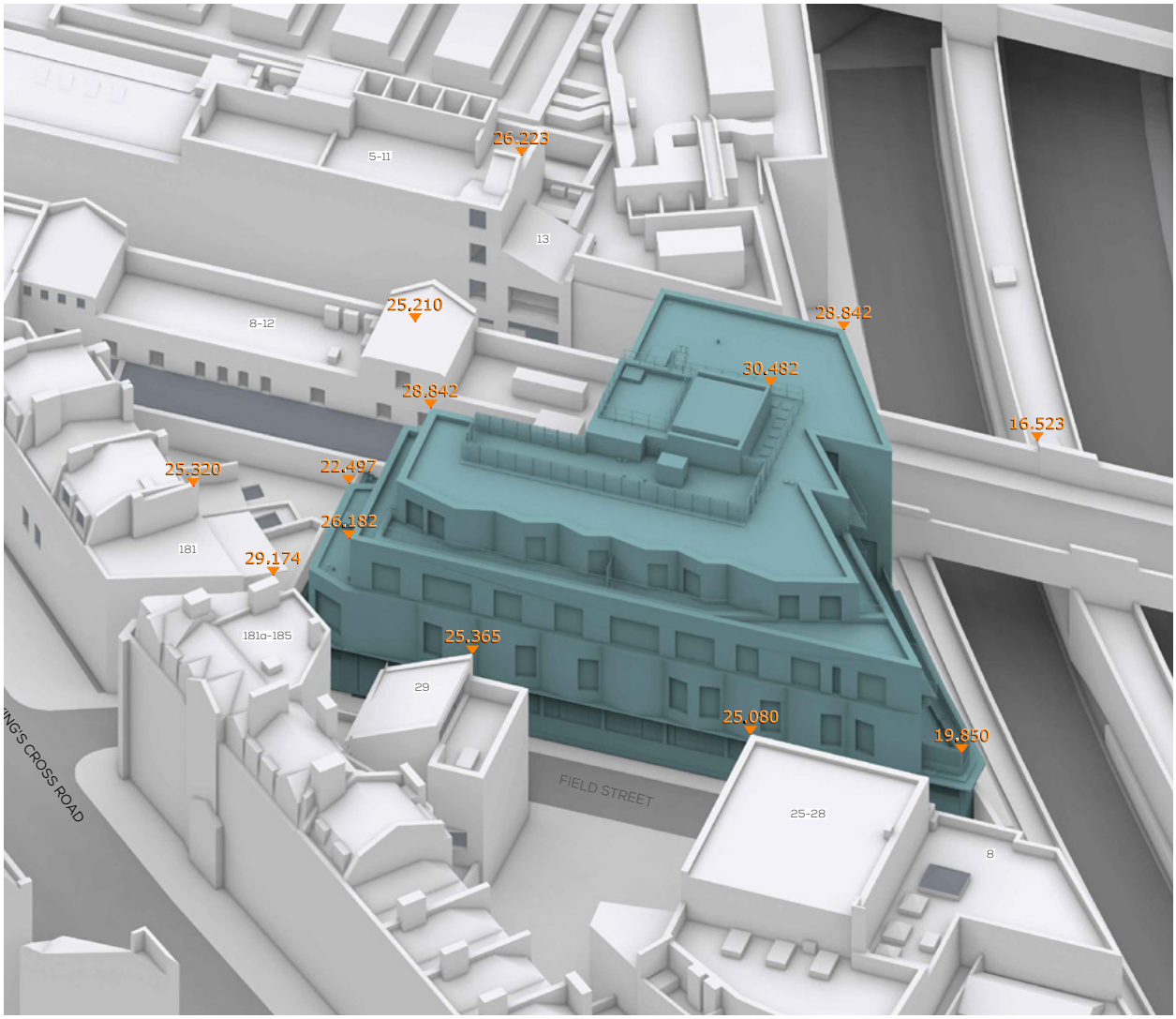

Figure 03: 3D Perspective View of the Proposed Scheme

3 POLICY & THE WIDER CONTEXT

3.1 Below we have detailed sections from the following documents as they are, in our opinion, the most pertinent in relation to daylight and sunlight matters and how we have approached the effects of the Proposed Development on the relevant neighbouring properties:

- National Planning Policy Framework (NPPF) (Feb 2019) (Ministry of Housing Communities and Local Government (MHCLG));
- National Planning Practice Guidance (NPPG) (updated October 2019) (MHCLG);
- The London Plan (March 2021) (Greater London Authority);
- Camden Local Plan (July 2017);
- London Borough of Camden Draft Holborn Vision and Strtegy (2019); and
- London Borough of Camden Draft Site Allocation Plan (2020).

NATIONAL PLANNING POLICY FRAMEWORK (JUNE 2019)

3.2 The NPPF (Feb 2019) states that local planning authorities should refuse applications which they consider fail to make efficient use of land. The discussion in relation to daylight and sunlight highlights the Government's recognition that increased flexibility is required in response to the requirement for higher density development.

> *"When considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site (as long as the resulting scheme would provide acceptable living standards)"*

NATIONAL PLANNING PRACTICE GUIDANCE (UPDATED JULY 2019)

3.3 In light of the update to the Government's Planning Practice Guidance, we have considered the relevant paragraphs on daylight and sunlight.

3.4 Paragraph 6 of the NPPG (Ref ID: 66-006-20190722) acknowledges that new development may cause an impact on daylight and sunlight levels enjoyed by neighbouring occupiers. It requires local authorities to assess whether the impact to neighbouring occupiers would be "unreasonable".

THE LONDON PLAN (MARCH 2021)

3.5 The London Plan was published in March 2021 and sets out the integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years.

3.6 Part D of Policy D6 (Housing Quality and Standards) states that the design of development "should provide sufficient daylight and sunlight to new and surrounding housing that is appropriate for its context, whilst avoiding overheating, minimising overshadowing and maximising the usability of outside amenity space."

3.7 It is clear that the GLA's focus is on sufficient or retained daylight and sunlight to neighbouring properties and highlights that context will be a consideration to determine sufficiency.

CAMDEN LOCAL PLAN (JULY 2017)

3.8 The Camden Local Plan was adopted by Council on 3 July 2017 and comprises the strategic and development management policies which will be used to inform development in the borough.

3.9 Policy A1 of the Camden Local Plan (2017) seeks to ensure that standard of amenity are protected. It states that the

> *"Council will seek to protect the quality of life of occupiers and neighbours. We will grant permission for development unless this causes unacceptable harm to amenity" (our emphasis).*

3.10 There are several factors the Council have identified as contributing to amenity, which includes "sunlight, daylight and overshadowing". The policy recognises that harm to daylight and sunlight condition within neighbouring properties, as well as overshadowing can occur, but it is to be considered whether this is "unacceptable".

3.11 A two staged approach should be considered when applying this policy:

- Whether there is any "harm" to existing daylight and sunlight levels and overshadowing of adjoining properties; and
- Whether the level of "harm" is unacceptable.

3.12 Supporting text requires applicants to refer to the BRE Guidelines (para 6.5).

LONDON BOROUGH OF CAMDEN DRAFT HOLBORN VISION AND STRATEGY (2019)

3.13 The Site is identified within the emerging Holborn Vision and Urban Strategy (2019) as a 'Key Project' for potential redevelopment. The guidance within this document supports active frontages ground level, increased residential population, and a through route on an axis with Coptic Street with future potential to connect to Covent Garden.

LONDON BOROUGH OF CAMDEN DRAFT SITE ALLOCATION PLAN (2020)

3.14 The Site lies within the Tottenham Court Road Growth Area, Tottenham Court Road Opportunity Area and within the Central Activities Zone ('CAZ').

3.15 The Site is identified as a development site within the Council's Draft Site Allocations Plan (2020) under Policy HCG3 ('1 Museum Street'). The draft allocation supports the comprehensive redevelopment of the Site with a mix of commercial and residential uses, emphasising the requirement for enhancing the public realm, permeability through the Site and ground level experience.

4 BRE GUIDELINES & CONTEXT METHODOLOGY

The Building Research Establishment (BRE) have set out in their handbook *'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice (2011)'*, guidelines and methodology for the measurement and assessment of daylight and sunlight.

BUILDING RESEARCH ESTABLISHMENT GUIDELINES 2011

4.1 The BRE Guidelines note that the document is intended to be used in conjunction with the interior daylight recommendations found within the British Standard BS8206-2:2008 and The Applications Manual on Window Design of the Chartered Institution of Building Services Engineers (CIBSE).

4.2 The BRE Guidelines provides three methodologies for daylight assessment of neighbouring properties, namely;

1 The Vertical Sky Component (VSC);

2 The No Sky Line (NSL); and

3 The Average Daylight Factor (ADF).

4.3 For daylight to be compliant (in accordance with figure 20 of the Guide), both the VSC and NSL tests have to be met.

4.4 The BRE Guidelines suggest that the ADF assessment should only be used to "check that adequate daylight is provided in new rooms", rather than existing buildings.

4.5 There is one methodology provided by the BRE Guidelines for sunlight assessment, denoted as Annual Probable Sunlight Hours (APSH).

4.6 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 planning and urban design matters to consider other than daylight and sunlight.

4.7 Appendix 02 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.

OVERSHADOWING

4.8 The BRE Guide provides two methods of overshadowing assessment, the Sun Hours on Ground and Transient Overshadowing studies.

4.9 The BRE guidance in respect of overshadowing of amenity spaces is set out in section 3.3 of the handbook. Here it states as follows:

> *"Sunlight in the spaces between 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)"*

4.10 Again, 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.

4.11 Likewise there may be many other urban design, planning and site constraints which determine and run contrary to the best form, sitting and location of a proposed development in terms of availability of sun on the ground.

4.12 The summary of section 3.3 of the guide states as follows:

> *"3. 3 .17 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. If a detailed calculation cannot be carried out, it is recommended that the centre of the area should receive at least two hours of sunlight on 21 March."*

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

5 DAYLIGHT & SUNLIGHT IMPACTS TO NEIGHBOURING PROPERTIES

This section details the daylight and sunlight impacts in relation to the relevant properties neighbouring the Site.

5.1 A three-dimensional computer model of the Site and surrounding properties was produced to carry out the relevant technical studies. All relevant assumptions made in producing this model can be found in Appendix 01.

SURROUNDING PROPERTIES

5.2 GIA have identified the following properties as relevant for daylight and sunlight assessment:

- 29 Field Street;
- 181 King's Cross Road;
- 181a-185 King's Cross Road (first floor up);
- 177 King's Cross Road; and
- 179 King's Cross Road.

5.3 The following properties adhere to the numerical values set out within the BRE Guidelines and are not discussed further:

- 29 Field Street;
- 181 King's Cross Road;
- 181a-185 King's Cross Road;
- 177 King's Cross Road; and
- 179 King's Cross Road.

6 SUN HOURS ON GROUND (SHOG) ASSESSMENTS

This section details the SHOG assessments undertaken for the adjoining amenity areas..

6.1 GIA have identified four private amenity spaces that may be overshadowed by the implementation of the proposed development. These gardens are located in the following properties:

- 29 Field Street;
- 181 King's Cross Road;
- 179 King's Cross Road; and
- 177 King's Cross Road.

6.2 Following implementation of the proposed development all amenity areas achieve BRE compliance for SHOG.

6.3 All SHOG results are located within Appendix 05.

6.4 The image in Figure 04 illustrates the SHOG in the existing condition:

6.5 The image in Figure 05 illustrates the SHOG in the proposed scenario:

6.6 The image in Figure 06 illustrates the loss:

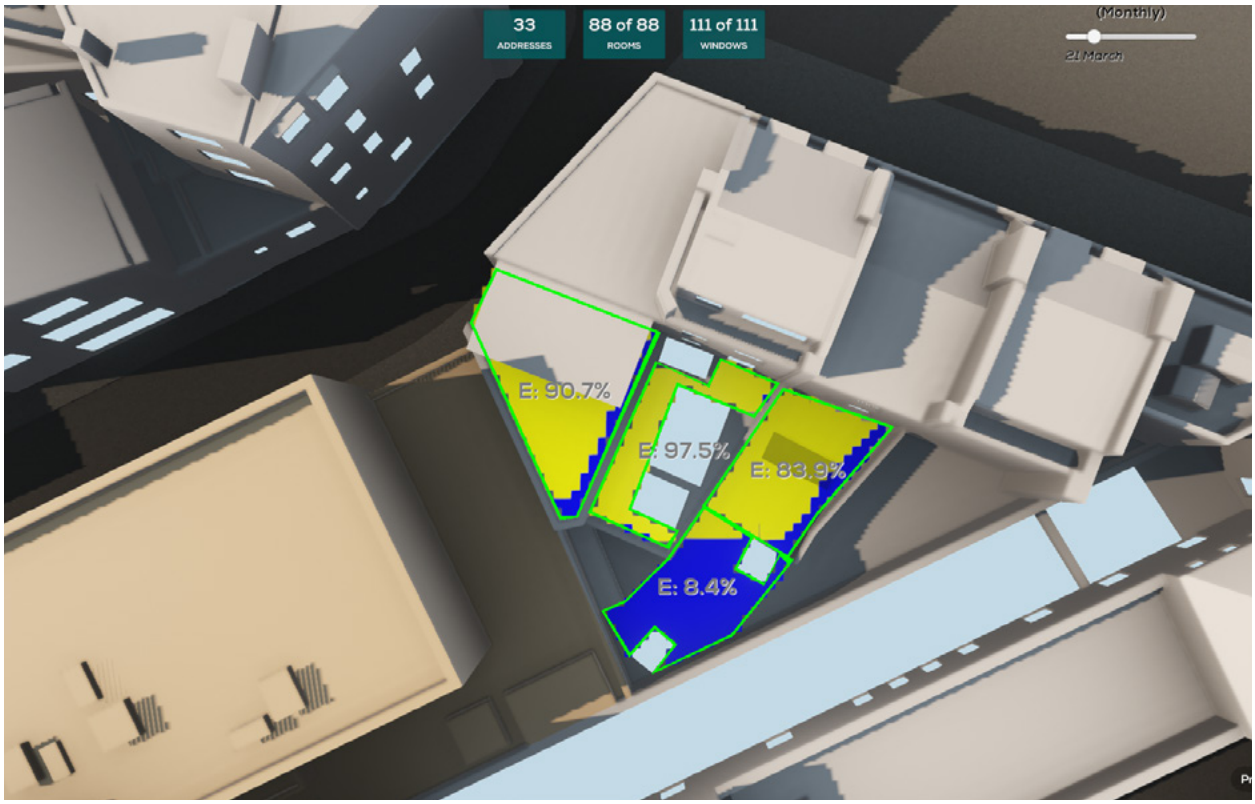

Figure 04: SHOG - Existing

Figure 05: SHOG - Proposed

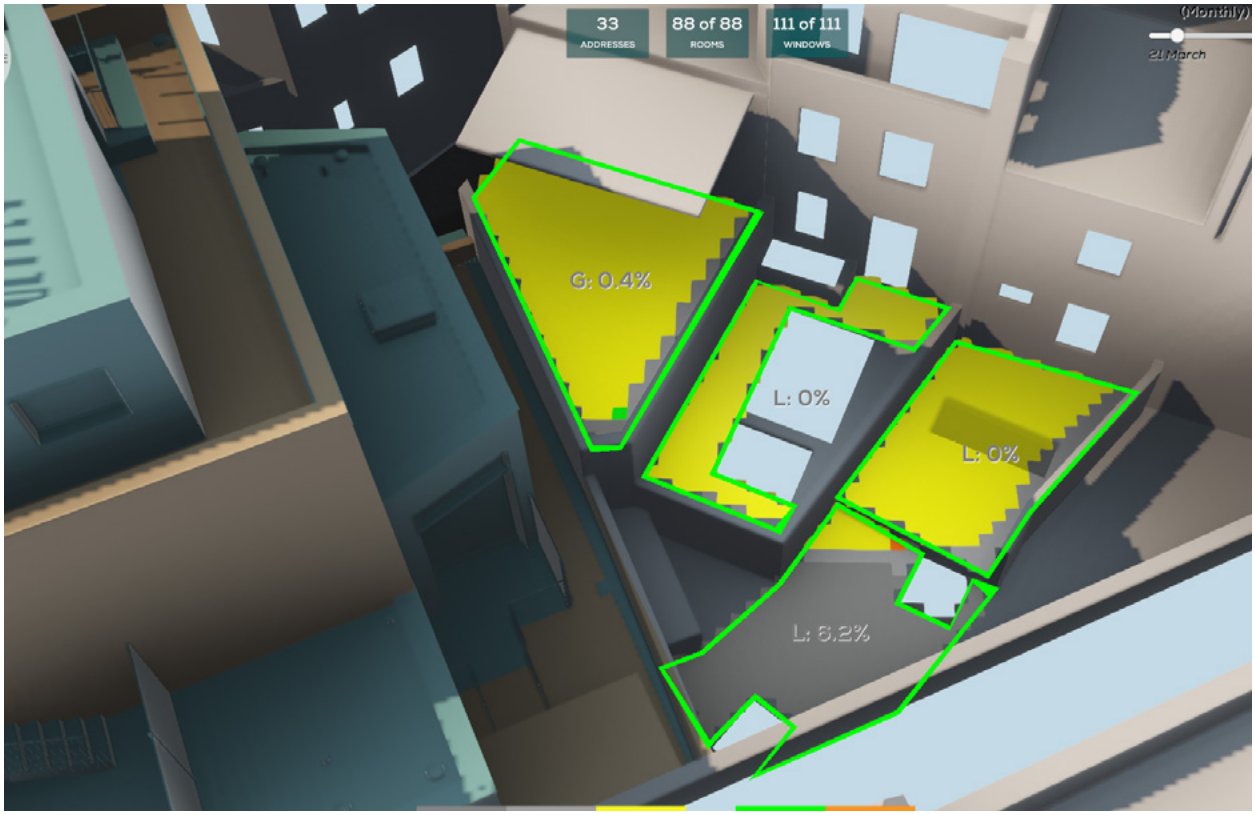

Figure 06: SHOG - Loss

7 CONCLUSIONS

GIA have undertaken a daylight and sunlight assessment in relation to the Proposed Development at The Joint, Field and Leeke Street. The technical analysis has been undertaken in accordance with the BRE Guidelines.

7.1 Throughout the design process, the scheme has been subjected to extensive testing to minimise the daylight and sunlight impacts to the surrounding residential properties.

7.2 When constructing buildings in an urban environment, alterations in daylight and sunlight to adjoining properties are often unavoidable. The numerical guidance given in the BRE document should be treated flexibly, especially in dense urban environments.

7.3 Our technical analysis shows that following the implementation of the Proposed Development, all relevant sourrounding propoerties will adhere to the baseline BRE guidelines for daylight and sunlight.

7.4 Further to the above, all amenity areas tested for SHOG achieve BRE compliance.

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DAYLIGHT, SUNLIGHT & SUN HOURS ON GROUND

IMPACT ON NEIGHBOURING PROPERTIES REPORT: APPENDICES

The Joint, Field and Leeke Street

CBRE Global Investors

03 February 2022

GIA No: **17319** Fee Quote: **FQ0003464**

PROJECT DATA:

Client	**CBRE Global Investors**
Architect	**Orbit Architects**
Project Title	**The Joint, Field and Leeke Street**
Project Number	**17319**

REPORT DATA:

Report Title	**Impact on Neighbouring Properties Appendices**
GIA Department	**Daylight & Sunlight**
Dated	**03 February 2022**
Fee Quote	**Fee Proposal No. 01**
Prepared by	**EG**
Checked by	**EG**
Type	**Final**

Revisions	No:	Date:	Notes:	Signed:

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ASSUMPTIONS

APPENDIX 01
ASSUMPTIONS

01

A 1.1 The context model has been produced using our VU.CITY platform. GIA have extracted the required area, creating a 3D model with an overall building tolerance of up to 150mm. The relevant windows have been added to the VU.CITY model from site photographs, observations and brick counting.

02

A 1.2 GIA have sought to create the most accurate 3D model possible based on the data available, however, a degree of tolerance should be applied.

03

A 1.3 The scope of buildings assessed has been determined as a reasonable zone which considers both the scale of the proposed scheme and the proximity of those buildings which surround and face the site. There may be properties outside of the considered scope that are affected by the scheme, however, no significant effects are anticipated.

04

A 1.4 The property uses have been ascertained by reference to a Valuation Office Agency search and/ or based upon external observations from a site visit carried out on date.

05

A 1.5 GIA have obtained full or partial floor plans for the following properties:

- 29 Field Street
- 177 Kings Cross Road
- 179 Kings Cross Road

A 1.6 These layouts have been incorporated into our 3D computer model. It is reasonable to assume that these layouts have been implemented, however, GIA would require access to confirm this.

06

A 1.7 Where GIA have not been able to source detailed internal floor-plans reasonable assumptions as to the internal layouts of the rooms behind the fenestration have been made. This is normal practice where access to adjoining properties is undesirable in terms of development confidentiality. Unless the building form dictates otherwise, we assume a standard 4.2m deep room (14ft) for residential properties.

07

A 1.8 Floor levels have been assumed for adjoining properties as access has not been obtained. This dictates the level of the working plane which is the point at which the No Sky Line assessments are carried out.

08

A 1.9 GIA have discounted rooms that appear to be or are confirmed to be bathrooms, hallways, circulation space etc. These rooms are not considered to be habitable and thus do not require assessment in accordance with the BRE Guidelines.

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APPENDIX 02

PRINCIPLES OF DAYLIGHT, SUNLIGHT & OVERSHADOWING

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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 2nd edition (2011)', guidelines and methodology for the measurement and assessment of daylight and sunlight.

BACKGROUND & CONTEXT

A 2.1 The quality of amenity and open spaces is often stipulated within planning policy for protection or enhancement and is often a concern for adjoining owners and other interested parties.

A 2.2 The BRE Guidelines provide advice on site layout planning to determine the quality of Daylight and Sunlight within open spaces between buildings.

A 2.3 The BRE Guidelines note that the document is intended to be used in conjunction with the interior Daylight recommendations found within the British Standard BS8206-2:2008 and The Applications Manual on Window Design of the Chartered Institution of Building Services Engineers (CIBSE).

A 2.4 The BRE 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, nor were the figures intended to be fixedly applied to all locations.

A 2.5 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".*[1]

A 2.6 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".*[2]

A 2.7 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. The BRE approach to creating alternative criteria is detailed within Appendix F of the Document.

A 2.8 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."*[3]

A 2.9 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.

A 2.10 It is important to note, however, that this document is a guide and states that its aim *"is to help rather than constrain the designer"*[4].

A 2.11 The document provides advice, but also clearly states that *"it is purely advisory and the numerical target values within it may be varied to meet the needs of the development and its location."*[5]

A 2.12 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 amenity.

A 2.13 In terms of considering what is a material deterioration in light, Local Authorities typically refer to the BRE Guide. 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.

A 2.14 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.

A 2.15 The following sections extract relevant sections from the Guide.

DAYLIGHT

A 2.16 The BRE Guidelines provide three methodologies for daylight assessment, namely;

1 The Vertical Sky Component (VSC);

2 The No Sky Line (NSL); and

3 The Average Daylight Factor (ADF).

Vertical Sky Component (VSC)

A 2.17 The Vertical Sky Component (VSC) method is described in the 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"*[6]

A 2.18 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).

A 2.19 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).[7]

A 2.20 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.

A 2.21 The VSC calculation has been undertaken in both the existing and proposed scenarios so as to make a comparison.

A 2.22 The image in Figure 01 depicts a waldram diagram which is used to calculate the VSC. The existing buildings are solidly pictured with the proposed scheme semi-transparent in the foreground.

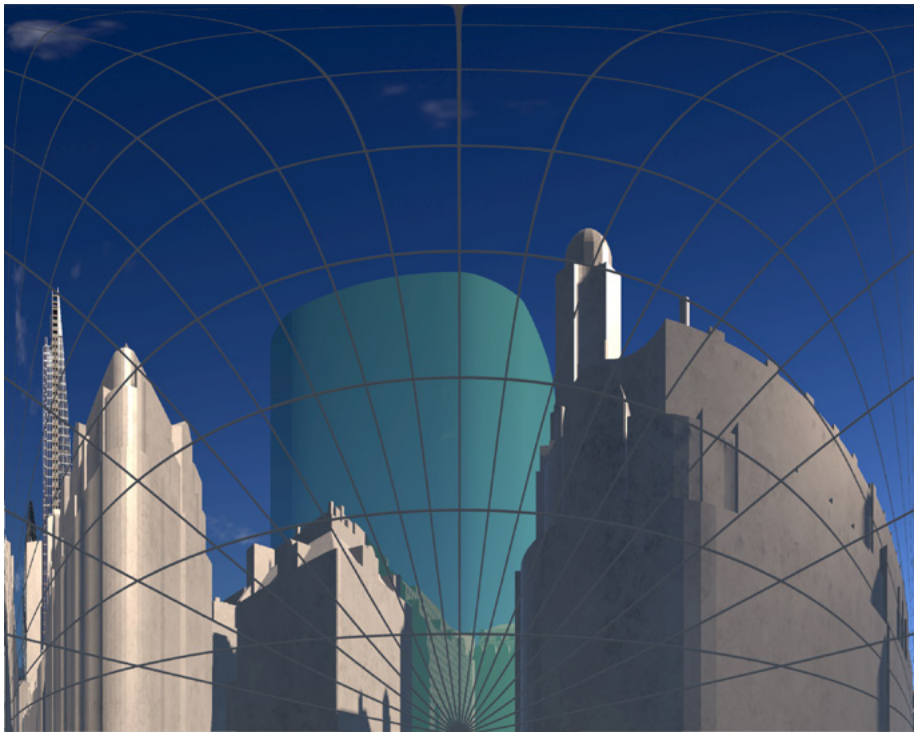

Figure 01: Waldram diagram

No Sky Line (NSL)

A 2.23 The BRE recommends the No Sky Line (NSL) method where internal layouts are known.

A 2.24 The No Sky Line (NSL) method is described as *"the outline on the working plane of the area from which no sky can be seen."*[8]

A 2.25 In summary, the NSL calculation assesses where the sky can and cannot be seen from inside a room at the working plane, *"in houses the working plane is assumed to be horizontal and 0.85m high".*[9]

A 2.26 The change in position of the NSL between the existing and proposed scenario is then calculated. This change can be illustrated on a contour plot, an example of which can be found in Figure 02.

A 2.27 The BRE Guidelines state at paragraph 2.2.9 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."*[10]

A 2.28 If the NSL experiences more than a 20% change from the existing situation then, in accordance with the strict application of the national numerical values, the change in daylight would be noticeable to the occupants.

A 2.29 This assessment takes the number and size of windows serving a room into account however, there is no qualitative assessment of the light in the room, only where sky can or cannot be seen.

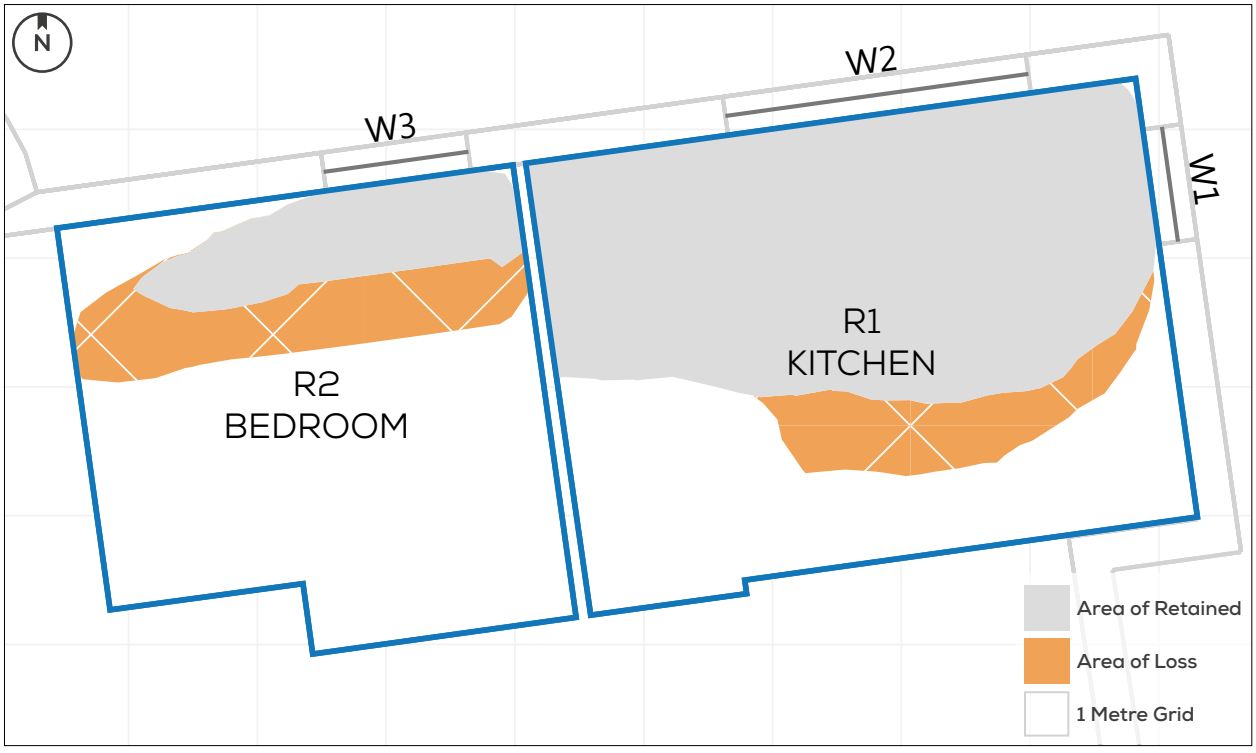

Figure 02: Example NSL diagram

Decision Chart (Figure 20 of the BRE Guide)

A 2.30 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*.

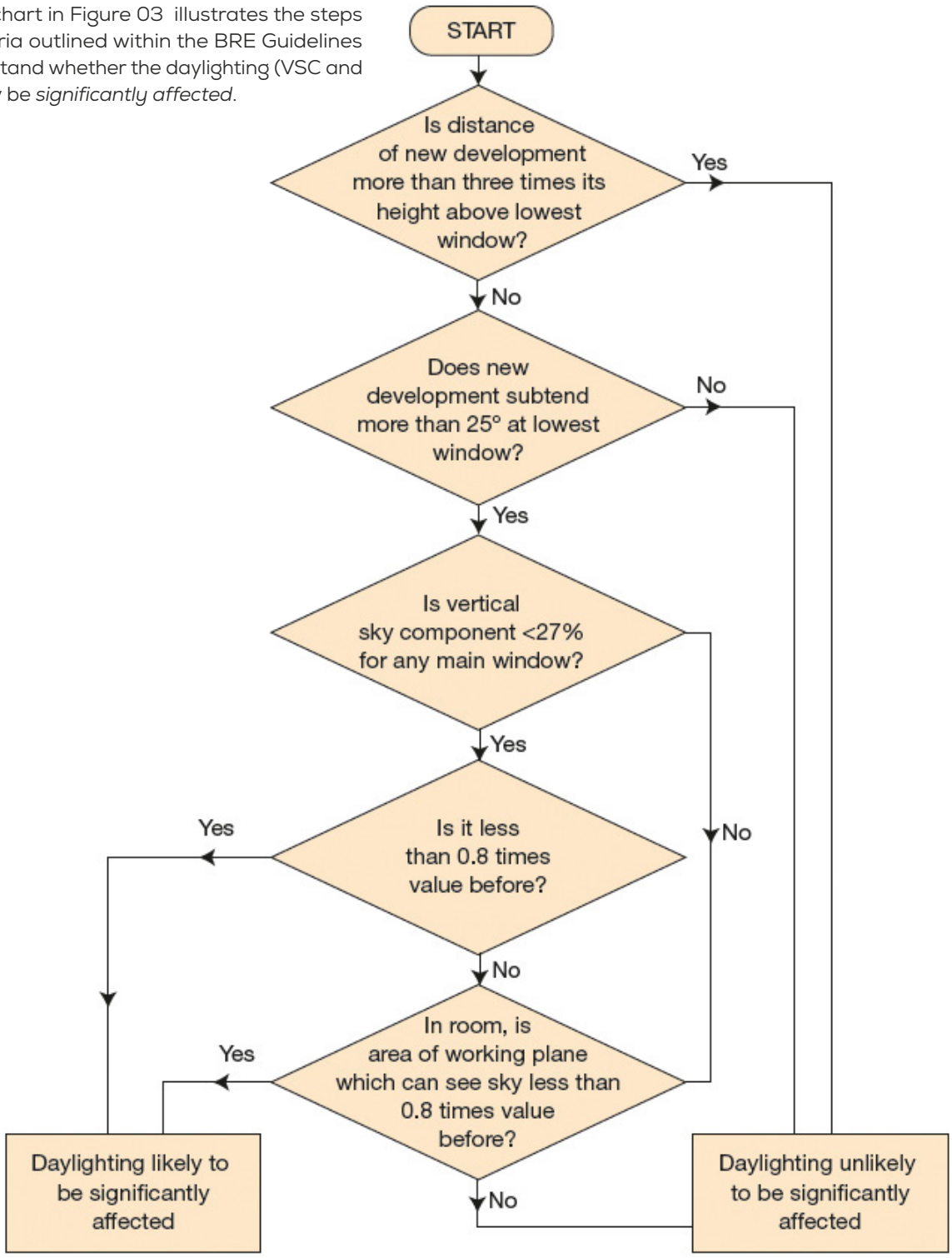

Figure 03: BRE Decision Chart (Figure 20): *diffuse daylight in existing buildings. This does not include an assessment of rights to light issues, which a developer may need to consider separately*

Average Daylight Factor (ADF)

A 2.31 The Average Daylight Factor (ADF) is defined within the 2011 BRE Guidelines as the *'ratio of total daylight flux incident on the working plane to the area of the working plane, expressed as a percentage of the outdoor illuminance on a horizontal plane due to an unobstructed CIE standard overcast sky. Thus a 1% ADF would mean that the average indoor illuminance would be one hundredth the outdoor unobstructed illuminance'*.[11]

A 2.32 This calculation considers not only the amount of skylight falling on the vertical face of the window, but also the glazing size, transmittance value, average reflectance, room area and room use. It is therefore a more detailed analysis of the daylight levels within a room.

A 2.33 British Standard 8206-2 quotes a number of recommended ADF levels based on room use. The ADF criteria is the prescribed methodology for evaluating the Daylight within proposed accommodation and the values referenced by the BRE Guidelines can be found in the British Standard document BS8206 Part II. The values for those rooms that are most relevant for our assessments are:

- Bedrooms 1% ADF
- Living rooms 1.5% ADF
- Kitchens 2% ADF[12]

A 2.34 Where one room serves more than one purpose, the minimum ADF should be that for the room type with the highest value.

A 2.35 As per the *British Standard Lighting for buildings - Part 2: Code of practice for daylighting* the ADF value should be 5%+ for a well daylit space:

> *"Where a predominantly daylit appearance is wanted, the criteria given in 5.5.2 and 5.5.3 should be adopted. The average daylight factor... is used as the measure of general illumination from skylight.*
>
> *5.5.2 If electric is not normally tp b eused during daytime, the average daylight factor should not be less than 5%*
>
> *5.5.3 If electric lighting is to be used throughout daytime, the average daylight factor should not be less than 2%.."*[13]

A 2.36 Appendix F of the BRE guidance states that, though not being generally recommended, the use of the ADF for loss of light to existing buildings can be appropriate in some situations:

- where the existing building is one of a series of new buildings that are being built one after another;
- where the existing building is proposed (i.e. consented) but not built;
- where the developer of the new building also owns the existing nearby building and proposes to carry out improvements to the existing building;
- where the developer also owns the existing nearby building and the affected rooms are either unoccupied or would be occupied by different people following construction of the new building.[14]

SUNLIGHT

Annual Probable Sunlight Hours (APSH)

A 2.37 The BRE Guidance suggests that to understand sunlight impacts to a property an assessment

A 2.38 of Annual Probable Sunlight Hours (APSH) is undertaken. The APSH is defined 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)"*[15]

A 2.39 In interpreting the results, the BRE Guidance states that the Sunlight to a window may be adversely affected if a point at the centre of a 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."[16]

A 2.40 To understand the potential sunlight impacts therefore, all windows facing within 90 degrees of due south and overlooking the development have been assessed for APSH.

A 2.41 The image in Figure 04 depicts the APSH sun spots 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.

A 2.42 The number of sun spots is calculated for both the whole year and during the winter period (21 September to 21 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.

A 2.43 The BRE Guidelines note that:

> *"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."*[17]

A 2.44 The BRE Guidelines set out the overall methodology and criteria for the assessment of Sunlight in Chapter 3. The BRE Guidelines state:

> *"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.*
>
> *If this window reference point can receive more than one quarter of Annual Probable Sunlight Hours [25%], including at least 5% of APSH in the winter months between 21 September and 21 March, then the room should still receive enough sunlight.*
>
> *Any reduction in sunlight access below this level should be kept to a minimum. If the available sunlight hours are both less than the amount above and less than 0.8 times their former value, either over the whole year or just during the winter months (21 September - 21 March), then the occupants of the existing building will notice the loss of sunlight; if the overall annual loss is greater than 4% of APSH, the room may appear colder and less cheerful and pleasant."*[18]

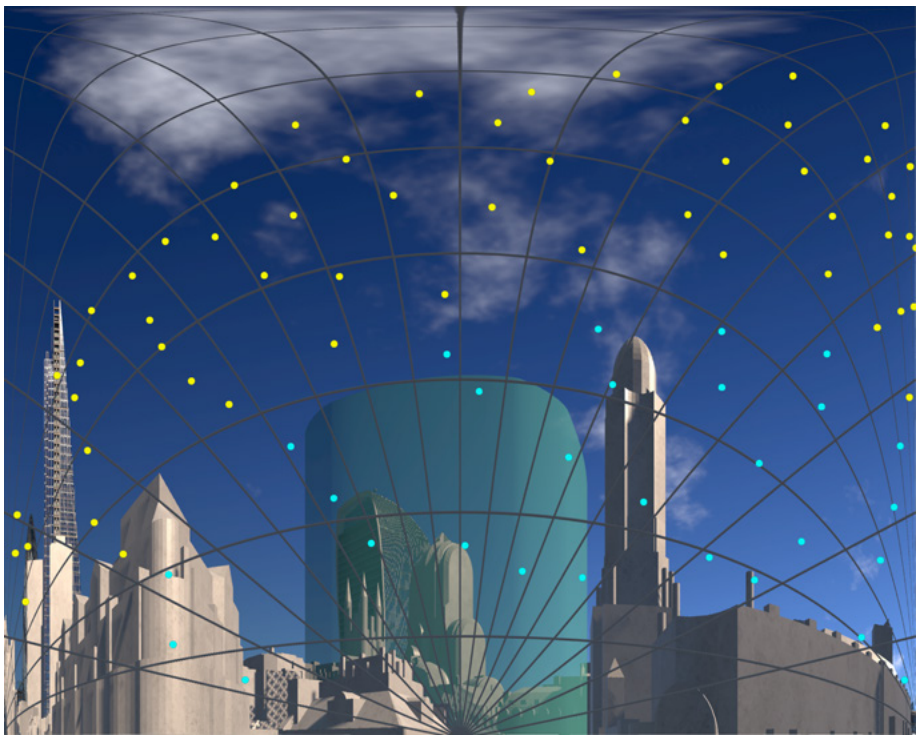

Figure 04: Waldram diagram

OVERSHADOWING

A 2.45 The BRE guidance in respect of overshadowing of amenity spaces is set out in section 3.3 of the handbook. Here it states as follows:

> *"Good site layout planning for daylight and sunlight should not limit itself to providing good natural lighting inside buildings. Sunlight in the spaces between 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)*
> - *To make outdoor activities, like sitting out and children's play more pleasant (mainly during the warmer months)*
> - *To encourage plant growth (mainly in spring and summer)*
> - *To dry out the ground, reducing moss and slime (mainly during the colder months)*
> - *To melt frost, ice and snow (in winter)*
> - *To dry clothes (all year)"*[19]

A 2.46 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

A 2.47 The Sun Hours on Ground (SHOG) method of overshadowing assessment uses a simulation software to determine the areas which receive direct Sunlight and those which do not.

A 2.48 The BRE Guidelines suggest that the Spring Equinox (21 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.

> *"It is recommended that for it [an amenity space] 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."*[20]

A 2.49 The Transient Overshadowing study is recommended where large buildings are proposed which may affect a number of gardens or open spaces. For the purpose of this assessment, the shadow is mapped at hourly intervals (from sun rise to sun set) on the following dates:

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

A 2.50 The September equinox is not assessed as this would provide the same results as those for 21 March.

A 2.51 The BRE guidelines do not provide any criteria for Transient Overshadowing.

BRE GUIDELINES: ADDITIONAL DAYLIGHT AND SUNLIGHT TESTS

Daylight - VSC and APSH to Rooms

A 2.52 As outlined within the BRE Guidelines the VSC value is calculated for each window; however -

> *"If a room has two or more windows of equal size, the mean of their VSC's may be taken".*[21]

A 2.53 Although not strictly in accordance with the BRE methodology, 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;

Σ(Vn*An) / ΣAn

Where:

V = window VSC
A = window area
n = the number of windows

A 2.54 The BRE provide a methodology to calculate APSH in relation to the room and window.

> *"If a room has multiple windows on the same walls or adjacent walls, the highest value of ASPH should be taken. If a room has two windows on opposite walls, the ASPH due to each can be added together."*[22]

A 2.55 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. A room served by multiple windows could receive the benefit of Sunlight entering from all of them and not just one.

A 2.56 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. This returns the per-room pass rate consistent with Section 3.1.10 of BR 209.

Balconies/Overhangs

A 2.57 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 5, paragraph 2.1.17 and page 8, paragraph 2.2.11:

> *"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."*[23]

A 2.58 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.

DAYLIGHT - MIRROR MASSING & ADJOINING DEVELOPMENT LAND

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

A 2.59 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).

A 2.60 The BRE notes:

> *"where an existing building has windows that are unusually close to the site boundary and taking more than their fair share of light. Figure 3 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."*[24]

A 2.61 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.

A 2.62 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

A 2.63 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."*

A 2.64 The BRE comments 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 should be taken. Measure the angle to the horizontal subtended at a point 1.6 m. 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)."*[25]
>
> *"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."*[26]
>
> *"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."*[27]

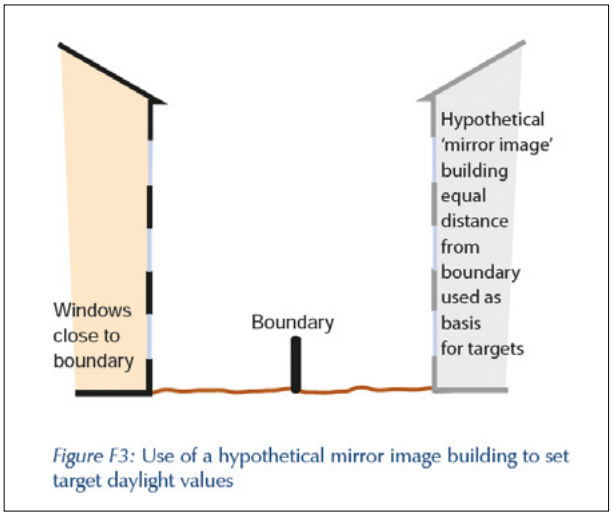

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Figure 05: Littlefair, P. (2011). Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: HIS BRE Press p 64 Figure F3

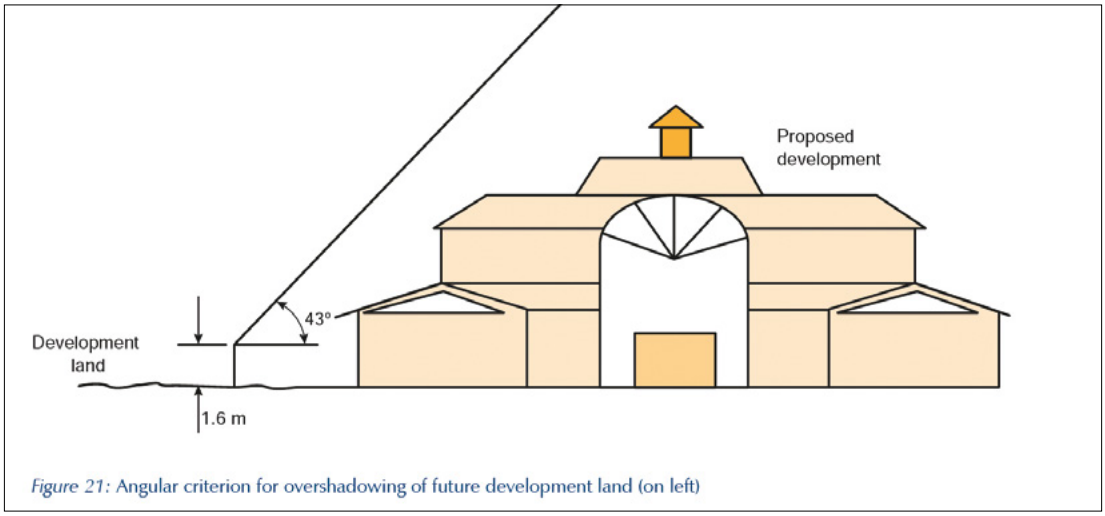

Figure 21: Angular criterion for overshadowing of future development land (on left)

Image © BRE Guidelines

Figure 06: Littlefair, P. (2011). Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: HIS BRE Press p 11 Figure F21

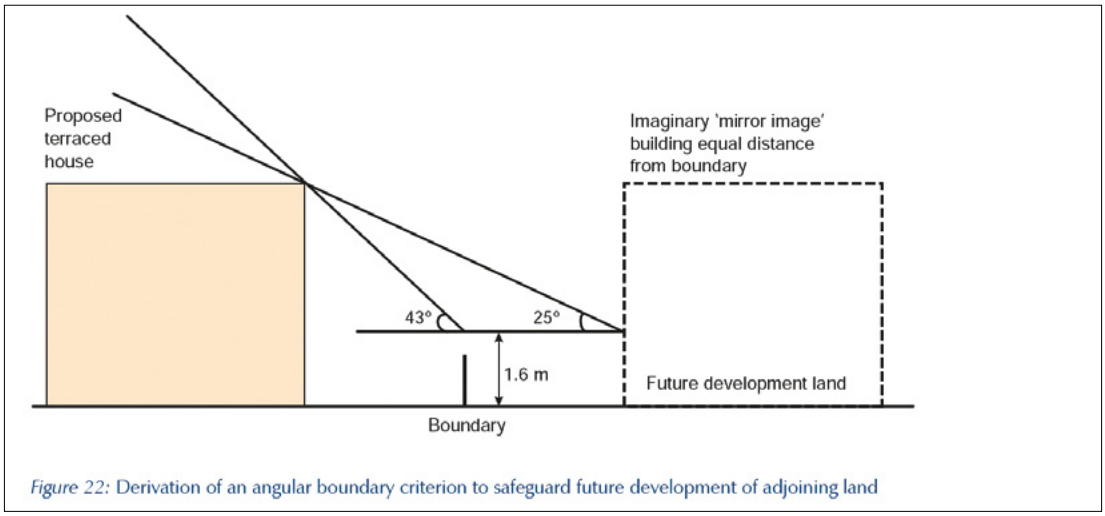

Figure 22: Derivation of an angular boundary criterion to safeguard future development of adjoining land

Image © BRE Guidelines

Figure 07: Littlefair, P. (2011). Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: HIS BRE Press p 12 Figure 22

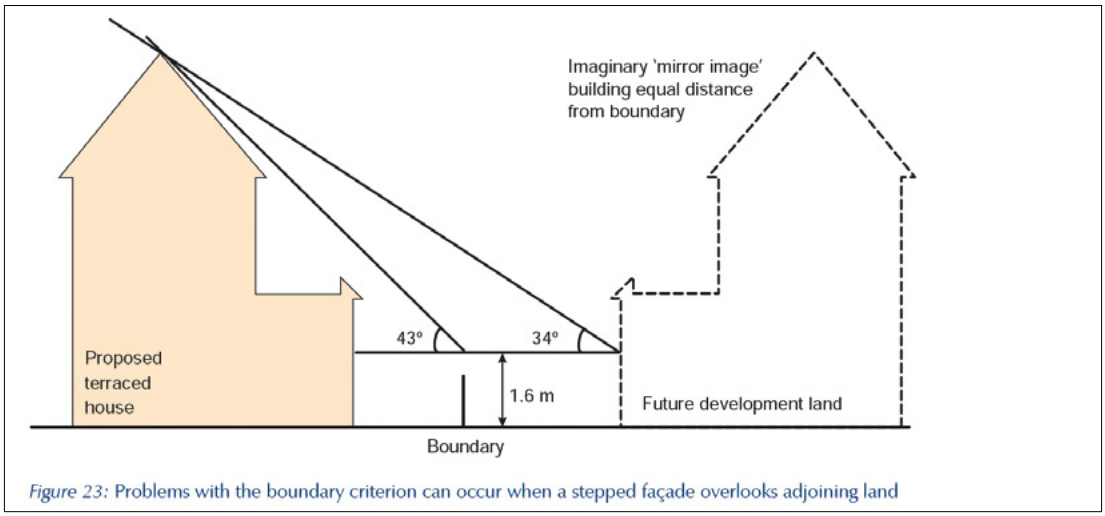

Figure 23: Problems with the boundary criterion can occur when a stepped façade overlooks adjoining land

Image © BRE Guidelines

Figure 08: Littlefair, P. (2011). Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: HIS BRE Press p 12 Figure 23

A 2.65 As is 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.

Other Amenity Considerations

A 2.66 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.

CONTEXT METHODOLOGY

A 2.67 In May 2019 the British Standard (BS8206-2:2008) was superseded by the new European Standard on daylight *"BS EN 17037:2018 Daylight in buildings"* but this standard is only applicable for assessing the levels of light within proposed developments. Until and unless it is revised, therefore, BR209 remains the basis for assessing impacts to neighbours and the new European Standard is not relevant for this report.

ENDNOTES

1 Littlefair, P. (2011). Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page 1, paragraph 1.6

2 Littlefair, P. (2011). Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page 7, paragraph 2.2.3

3 Littlefair, P. (2011). Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page 7 paragraph 2.2.2

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5 Littlefair, P. (2011). Site layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page v

6 Littlefair, P. (2011). Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, Glossary page viii

7 Littlefair, P. (2011). Site layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page 7, paragraph 2.2.7

8 Littlefair, P. (2011). Site layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, Glossary page viii

9 Littlefair, P. (2011). Site layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page 7, paragraph 2.2.8

10 Littlefair, P. (2011). Site layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page 8, paragraph 2.2.9

11 Littlefair, P. (2011). Site layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, Glossary page viii

12 British Standard 8206-2:2008, page 9, paragraph 5.6

13 British Standard 8206-2:2008, page 9, paragraph 5.5

14 Littlefair, P. (2011). Site layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page 64, paragraph F8

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16 Littlefair, P. (2011). Site layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page 17, paragraph 3.2.11

17 Littlefair, P. (2011). Site layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page 16 paragraph 3.2.3 and paragraph 3.2.4

18 Littlefair, P. (2011). Site layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page 16 paragraph 3.2.3, paragraph 3.2.4 and 3.2.5 and page 17 paragraph 3.2.6

19 Littlefair, P. (2011). Site layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page 18, paragraph 3.3.1

20 Littlefair, P. (2011). Site layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page 20, paragraph 3.3.17

21 Littlefair, P. (2011). Site layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page 7, paragraph 2.2.6

22 Littlefair, P. (2011). Site layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page 16, paragraph 3.1.12

23 Littlefair, P. (2011). Site layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page 5, paragraph 2.1.17 and page 8, paragraph 2.2.11

24 Littlefair, P. (2011). Site layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page 62, paragraph F5

25 Littlefair, P. (2011). Site layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page 11, paragraph 2.3.3

26 Littlefair, P. (2011). Site layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page 11, paragraph 2.3.6

27 Littlefair, P. (2011). Site layout Planning for Daylight and Sunlight – A Guide to Good Practice. Hertfordshire: IHS BRE Press, page 11 paragraph 2.3.7

APPENDIX 03
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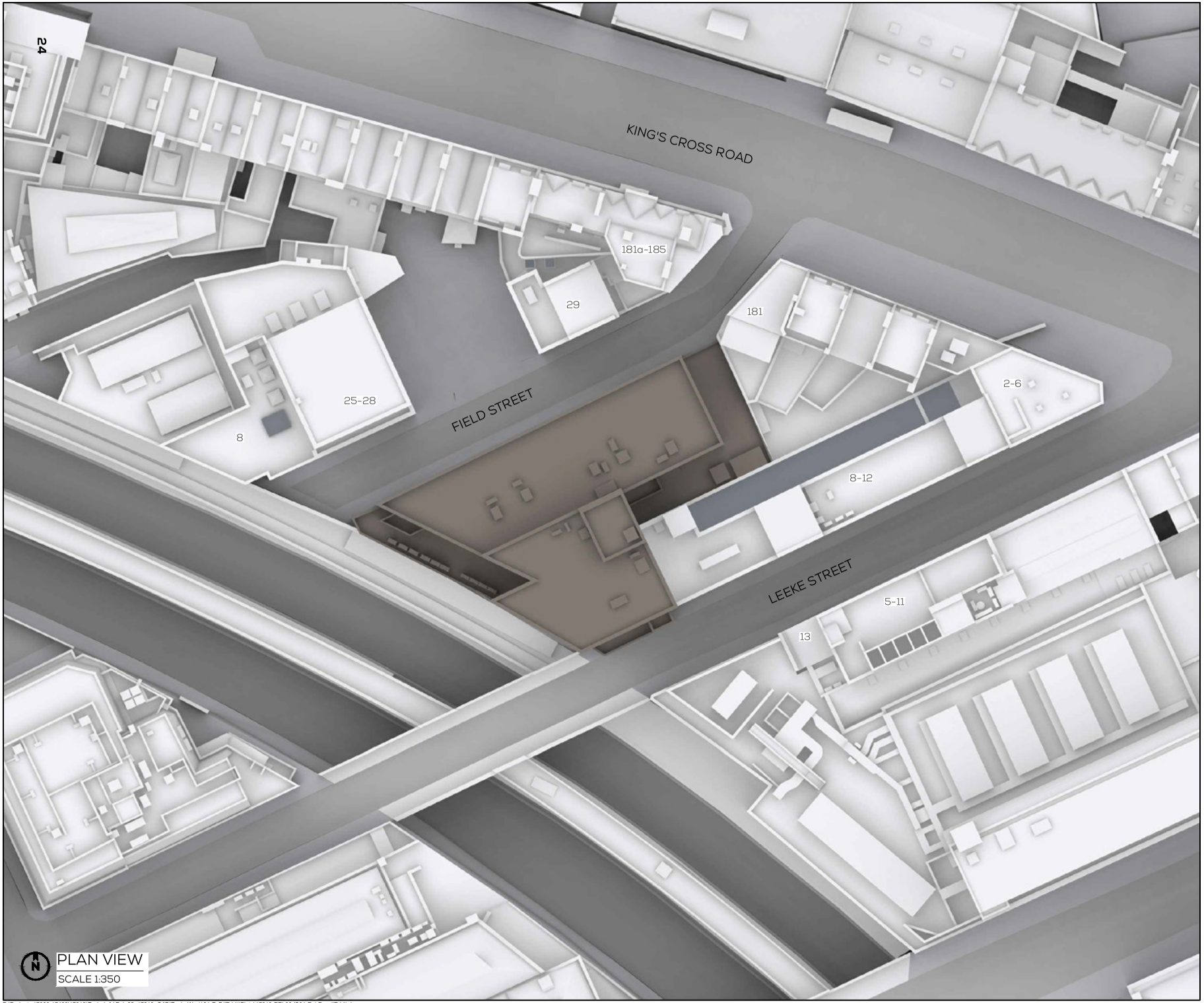

PLAN VIEW
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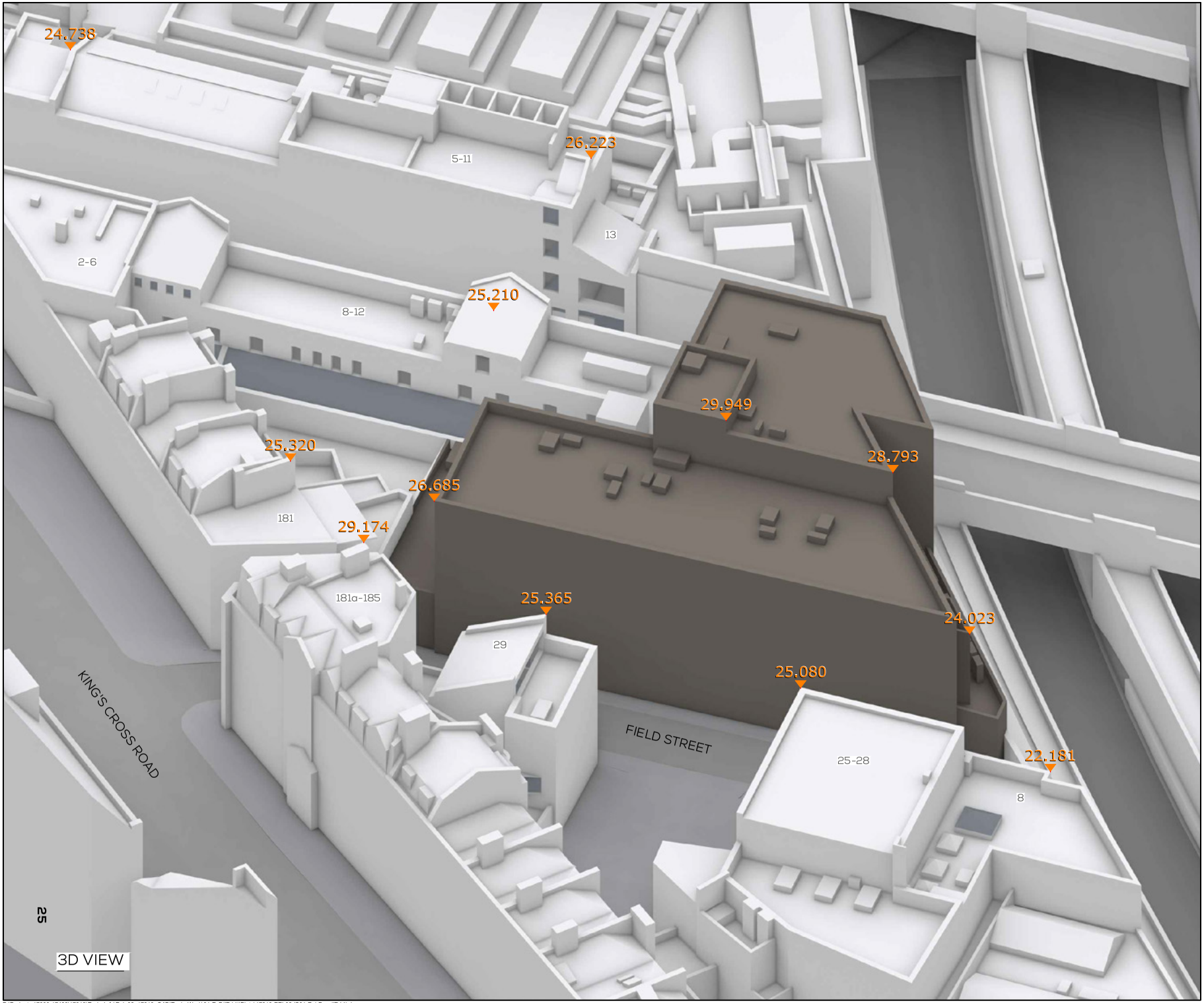

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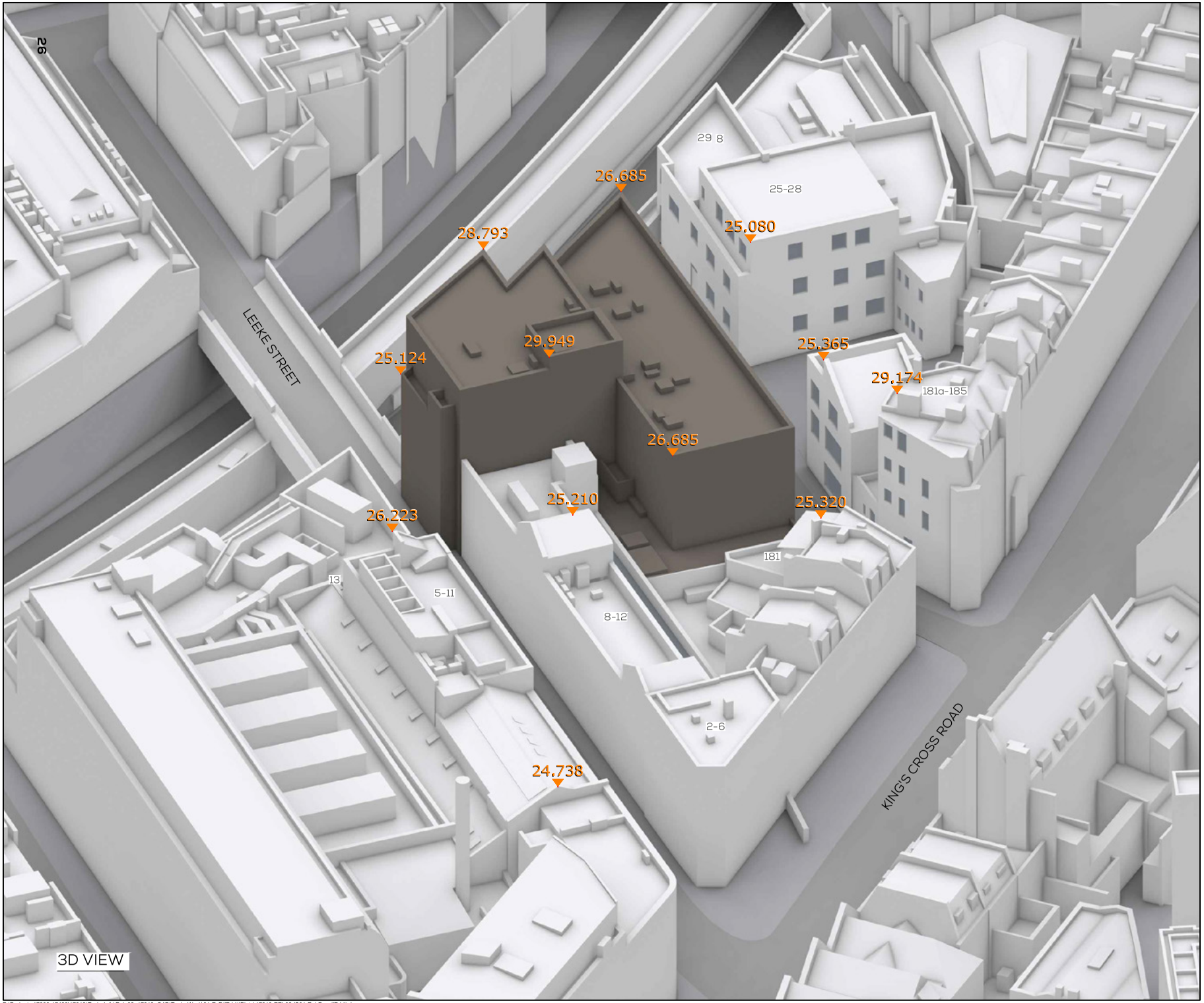

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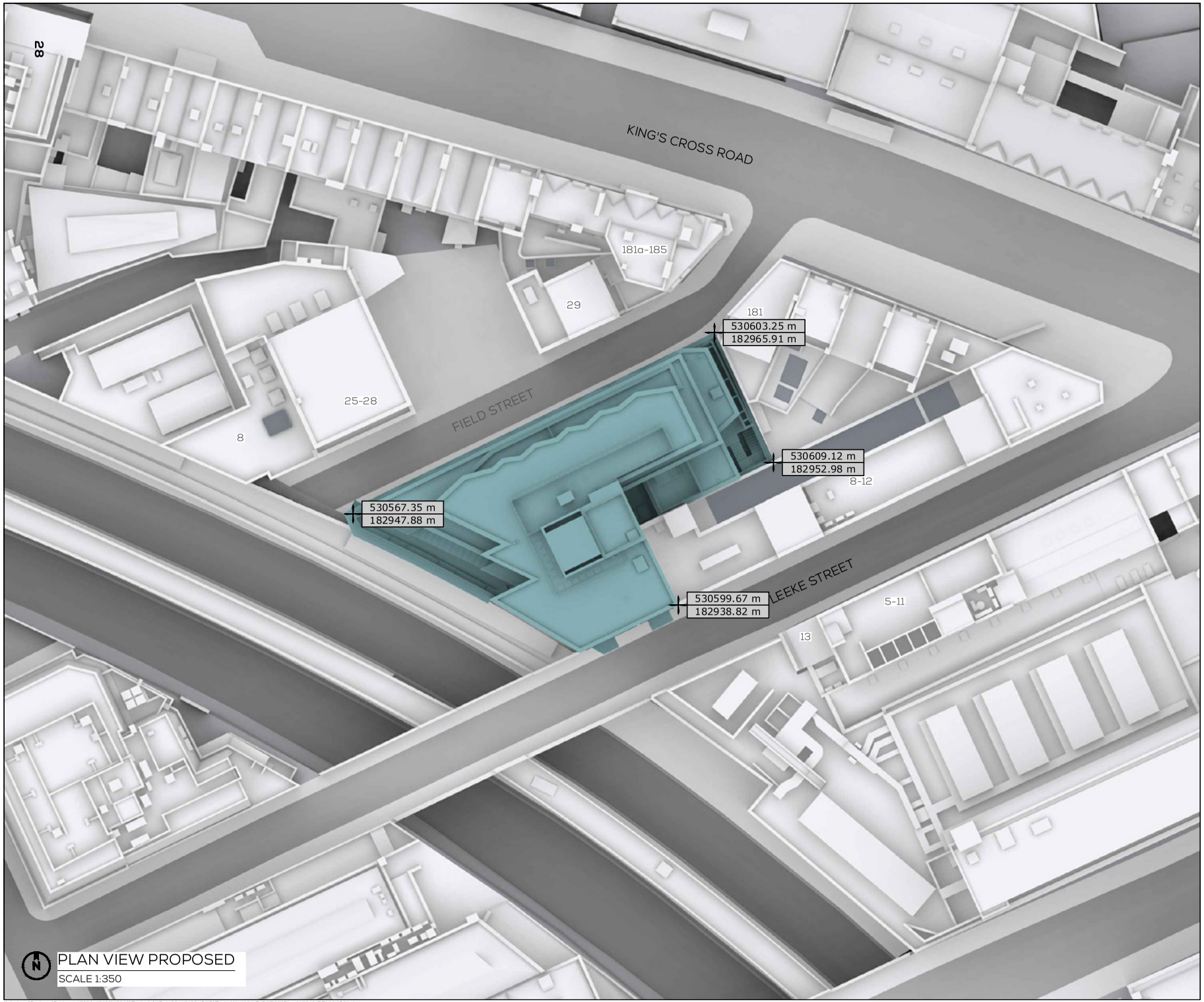

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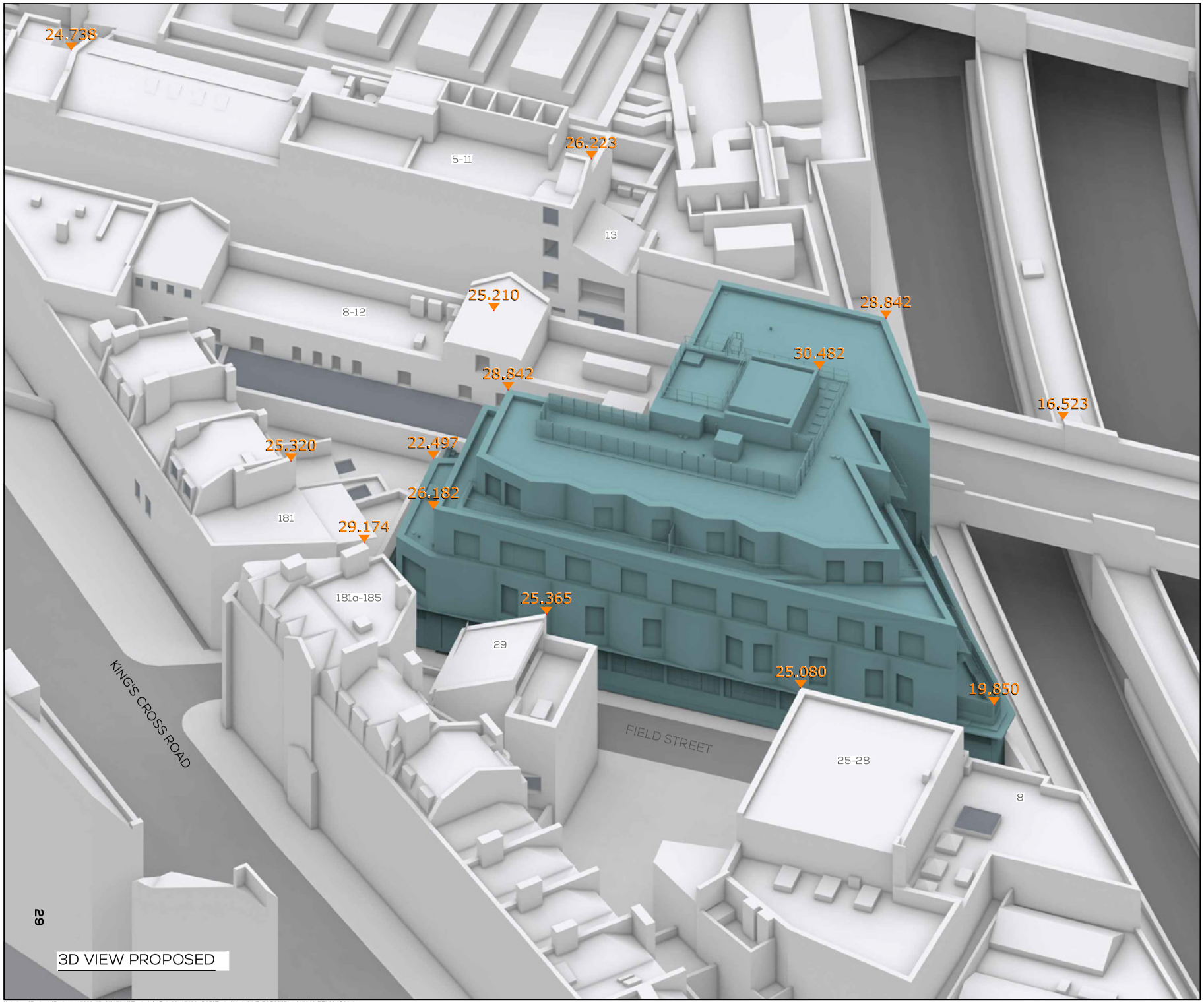

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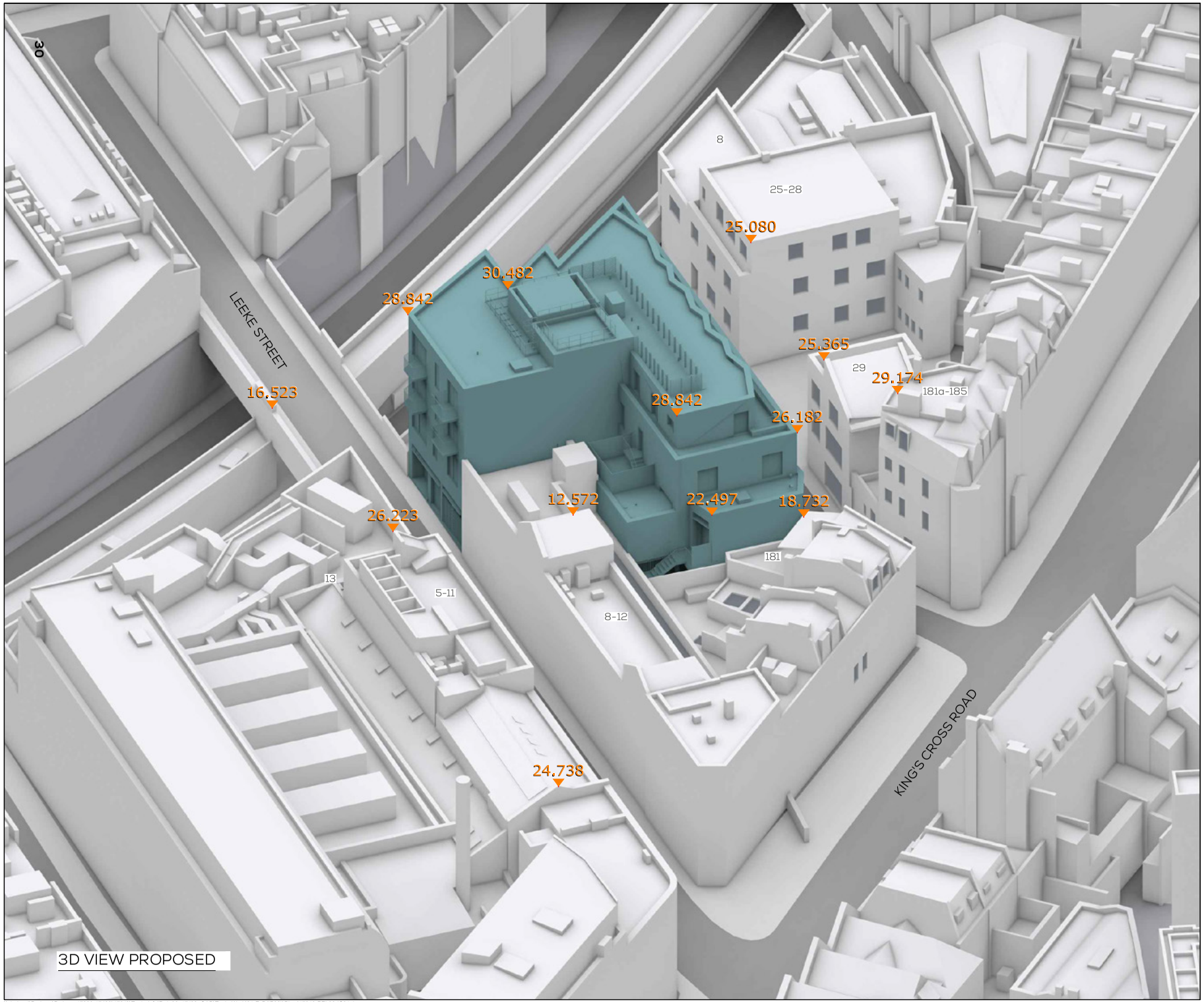

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THE JOINT - FIELD & LEEKE STREET

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3D VIEW PROPOSED
PROPOSED IR32
RECEIVED 27.01.22

DWN BY	SCALE	CHK BY	DATE	REV No.
EVVE	NTS@A3	MAAN	JAN.22	A
PROJ No.	REL No.	ADDR No.	IS No.	DWG No.
17319	06	-	01	06

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APPENDIX 04
RESULTS

APPENDIX 04
RESULTS & CONTOURS:

EXISTING v PROPOSED (RESULTS)

						VSC (WINDOW)				VSC (ROOM)				NSL				APSH (WINDOW)						APSH (ROOM)					
FLOOR	ROOM	PROPERTY TYPE	ROOM USE	ROOM NOTES	WINDOW	EX. %	PR. %	LOSS	LOSS %	EX. %	PR. %	LOSS	LOSS %	EX. %	PR. %	LOSS SQM	LOSS %	EX.		PR.		LOSS %		EX.		PR.		LOS	
																		ANNUAL	WINTER	ANNUAL	WINTER	ANNUAL	WINTER	ANNUAL	WINTER	ANNUAL	WINTER	ANNUAL	
29 FIELD STREET																													
F01	R1	RESIDENTIAL	LKD		W1/F01	11	11.1	-0.1	-0.9%	11.9	11.9	0	0.0%	58.7	49.3	4.0	16.0%	27	1	27	1	0.0%	0.0%	41	1	42	1	-2.4%	
			LKD		W2/F01	12.1	12	0.1	0.8%									31	1	32	1	-3.2%	0.0%						
			LKD		W3/F01	13.2	13.2	0	0.0%									0	0	0	0	0.0%	0.0%						
F02	R1	RESIDENTIAL	BEDROOM		W1/F02	17.4	16.3	1.1	6.3%	17.4	16.3	1.1	6.3%	31.4	28	0.4	10.7%	47	3	47	3	0.0%	0.0%	47	3	47	3	0.0%	
	R2	RESIDENTIAL	BEDROOM		W2/F02	19	17.8	1.2	6.3%	30.5	29.5	1	3.3%	93	92.9	0.0	0.2%	52	4	50	3	3.8%	25.0%	80	18	75	13	6.3%	
			BEDROOM		W3/F02	34.8	33.9	0.9	2.6%									59	18	54	13	8.5%	27.8%						
181 KINGS CROSS ROAD																													
F01	R1	RESIDENTIAL	UNKNOWN		W1/F01	6.7	6.7	0	0.0%	6.7	6.7	0	0.0%	47.4	46.4	0.0	2.0%	18	2	18	2	0.0%	0.0%	18	2	18	2	0.0%	
	R2	RESIDENTIAL	UNKNOWN		W2/F01	0.7	0.7	0	0.0%	0.7	0.7	0	0.0%	36	35.8	0.0	0.6%	1	1	1	1	0.0%	0.0%	1	1	1	1	0.0%	
181A-185 KINGS CROSS ROAD																													
F01	R1	RESIDENTIAL	UNKNOWN		W1/F01	20.7	19.6	1.1	5.3%	20.7	19.6	1.1	5.3%	69.5	64.2	0.7	7.7%	52	7	50	6	3.8%	14.3%	52	7	50	6	3.8%	
	R2	RESIDENTIAL	UNKNOWN		W3/F01	26.7	26.4	0.3	1.1%	26.7	26.4	0.3	1.1%	93.7	93.7	0.0	0.0%	52	8	52	8	0.0%	0.0%	52	8	52	8	0.0%	
	R3	RESIDENTIAL	UNKNOWN		W2/F01	25.6	25.4	0.2	0.8%	25.6	25.4	0.2	0.8%	95.4	95.3	0.0	0.0%	52	9	52	9	0.0%	0.0%	52	9	52	9	0.0%	
	R4	RESIDENTIAL	UNKNOWN		W4/F01	25.5	25.3	0.2	0.8%	25.5	25.3	0.2	0.8%	95.7	95.7	0.0	0.0%	52	9	52	9	0.0%	0.0%	52	9	52	9	0.0%	
	R5	RESIDENTIAL	UNKNOWN		W5/F01	3	3	0	0.0%	3	3	0	0.0%	36.1	34.9	0.1	3.2%	5	0	5	0	0.0%	0.0%	5	0	5	0	0.0%	
F02	R1	RESIDENTIAL	UNKNOWN		W1/F02	30.4	28.7	1.7	5.6%	30.4	28.7	1.7	5.6%	97.2	85.5	1.5	12.1%	74	18	72	16	2.7%	11.1%	74	18	72	16	2.7%	
	R2	RESIDENTIAL	UNKNOWN		W3/F02	33.3	32.9	0.4	1.2%	33.3	32.9	0.4	1.2%	96	96	0.0	0.0%	64	17	63	16	1.6%	5.9%	64	17	63	16	1.6%	
	R3	RESIDENTIAL	UNKNOWN		W2/F02	33.4	33.1	0.3	0.9%	33.4	33.1	0.3	0.9%	95.4	95.4	0.0	0.0%	67	20	65	18	3.0%	10.0%	67	20	65	18	3.0%	
	R4	RESIDENTIAL	UNKNOWN		W4/F02	33.9	33.6	0.3	0.9%	33.9	33.6	0.3	0.9%	95.7	95.7	0.0	0.0%	66	19	65	18	1.5%	5.3%	66	19	65	18	1.5%	
F03	R1	RESIDENTIAL	UNKNOWN		W1/F03	36.5	34.7	1.8	4.9%	36.5	34.7	1.8	4.9%	98.8	98.8	0.0	0.0%	86	29	85	28	1.2%	3.4%	86	29	85	28	1.2%	
	R2	RESIDENTIAL	UNKNOWN		W3/F03	37.1	36.4	0.7	1.9%	37.1	36.4	0.7	1.9%	90.3	90.3	0.0	0.0%	69	24	69	24	0.0%	0.0%	69	24	69	24	0.0%	
	R3	RESIDENTIAL	UNKNOWN		W2/F03	37.3	36.8	0.5	1.3%	37.3	36.8	0.5	1.3%	97.2	97.2	0.0	0.0%	72	25	72	25	0.0%	0.0%	72	25	72	25	0.0%	
177 KINGS CROSS ROAD																													
F00	R1	RESIDENTIAL	LD		W1/F00 / HZ (2)	56.8	56.8	0	0.0%	55.5	55.4	0.1	0.2%	63.4	63.4	0.0	0.0%	45	4	45	4	0.0%	0.0%	45	4	46	4	-2.2%	
			LD		W2/F00 / HZ (2)	62.1	62.2	-0.1	-0.2%									26	0	27	0	-3.8%	0.0%						
			LD		W3/F00 / HZ (2)	45.2	44.8	0.4	0.9%									0	0	0	0	0.0%	0.0%						
F01	R1	RESIDENTIAL	BEDROOM		W1/F01	25.3	25.1	0.2	0.8%	25.6	25.5	0.1	0.4%	96.9	97.1	0.0	-0.2%	58	12	57	12	1.7%	0.0%	70	12	69	12	1.4%	
			BEDROOM		W3/F01	25.8	25.8	0	0.0%									12	0	12	0	0.0%	0.0%						

(1) KITCHEN SMALLER THAN 13m2

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

(3) SINGLE ASPECT ROOM DEEPER THAN 5m

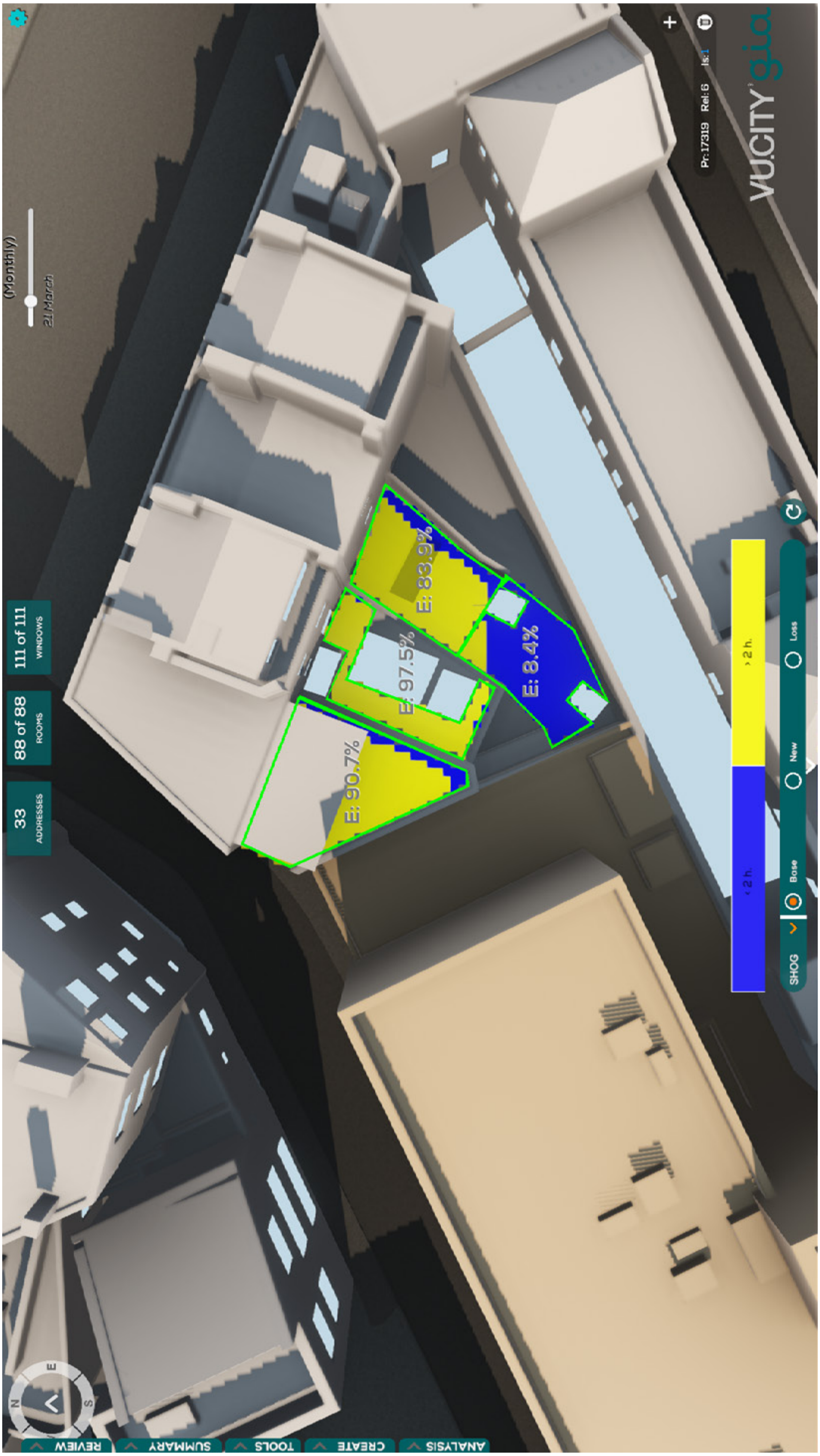
						VSC (WINDOW)				VSC (ROOM)				NSL				APSH (WINDOW)						APSH (ROOM)					
FLOOR	ROOM	PROPERTY TYPE	ROOM USE	ROOM NOTES	WINDOW	EX. %	PR. %	LOSS	LOSS %	EX. %	PR. %	LOSS	LOSS %	EX. %	PR. %	LOSS SQM	LOSS %	EX.		PR.		LOSS %		EX.		PR.		LOS	
																		ANNUAL	WINTER	ANNUAL	WINTER	ANNUAL	WINTER	ANNUAL	WINTER	ANNUAL	WINTER	ANNUAL	
177 KINGS CROSS ROAD (CONTINUED)																													
			BEDROOM		W4/F01	25.7	25.7	0	0.0%									4	0	4	0	0.0%	0.0%						
F02	R1	RESIDENTIAL	BEDROOM		W1/F02	30.9	30.6	0.3	1.0%	30.9	30.6	0.3	1.0%	99.3	98.8	0.0	0.5%	77	23	76	22	1.3%	4.3%	77	23	76	22	1.3%	
179 KINGS CROSS ROAD																													
F00	R1	RESIDENTIAL	LIVING ROOM		W1/F00 / HZ (2)	70.8	71.1	-0.3	-0.4%	64.1	64.2	-0.1	-0.2%	99.1	99.1	0.0	0.0%	51	7	51	7	0.0%	0.0%	56	11	56	11	0.0%	
			LIVING ROOM		W2/F00 / HZ (2)	61.4	61.4	0	0.0%									53	11	53	11	0.0%	0.0%						
	R2	RESIDENTIAL	UNKNOWN		W2/F01 / HZ (2)	38.7	38.6	0.1	0.3%	38.7	38.6	0.1	0.3%	70.5	70.5	0.0	0.0%	53	16	53	16	0.0%	0.0%	53	16	53	16	0.0%	
F01	R1	RESIDENTIAL	DINING ROOM		W1/F01	25.5	25.3	0.2	0.8%	25.5	25.3	0.2	0.8%	91.3	90	0.1	1.4%	60	18	59	18	1.7%	0.0%	60	18	59	18	1.7%	
F03	R1	RESIDENTIAL	BEDROOM		W1/F03	32.3	32.3	0	0.0%	31.5	31.1	0.4	1.3%	99.1	99	0.0	0.0%	3	0	3	0	0.0%	0.0%	72	19	71	19	1.4%	
			BEDROOM		W2/F03	32.3	32.3	0	0.0%									4	0	4	0	0.0%	0.0%						
			BEDROOM		W3/F03	30.9	30.2	0.7	2.3%									59	19	58	19	1.7%	0.0%						

(1) KITCHEN SMALLER THAN 13m2

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

(3) SINGLE ASPECT ROOM DEEPER THAN 5m

APPENDIX 05
SHOG ASSESSMENT


(Monthly)
21 March
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ADDRESSES
88 of 88
ROOMS
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WINDOWS
E: 90.7%
E: 97.5%
E: 83.9%
E: 8.4%
Pr:17319
Rel:6
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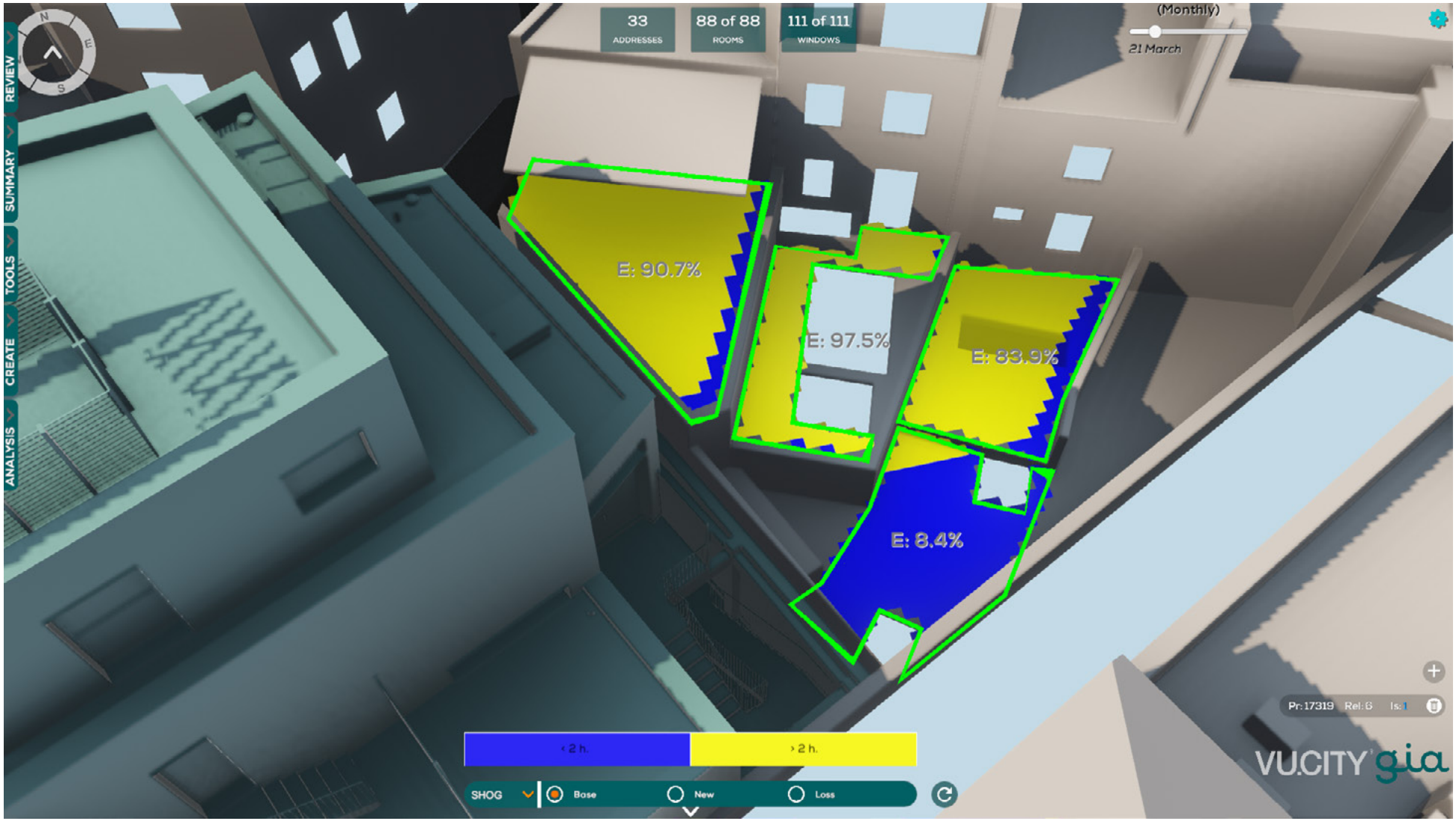
ANALYSIS
CREATE
TOOLS
SUMMARY
REVIEW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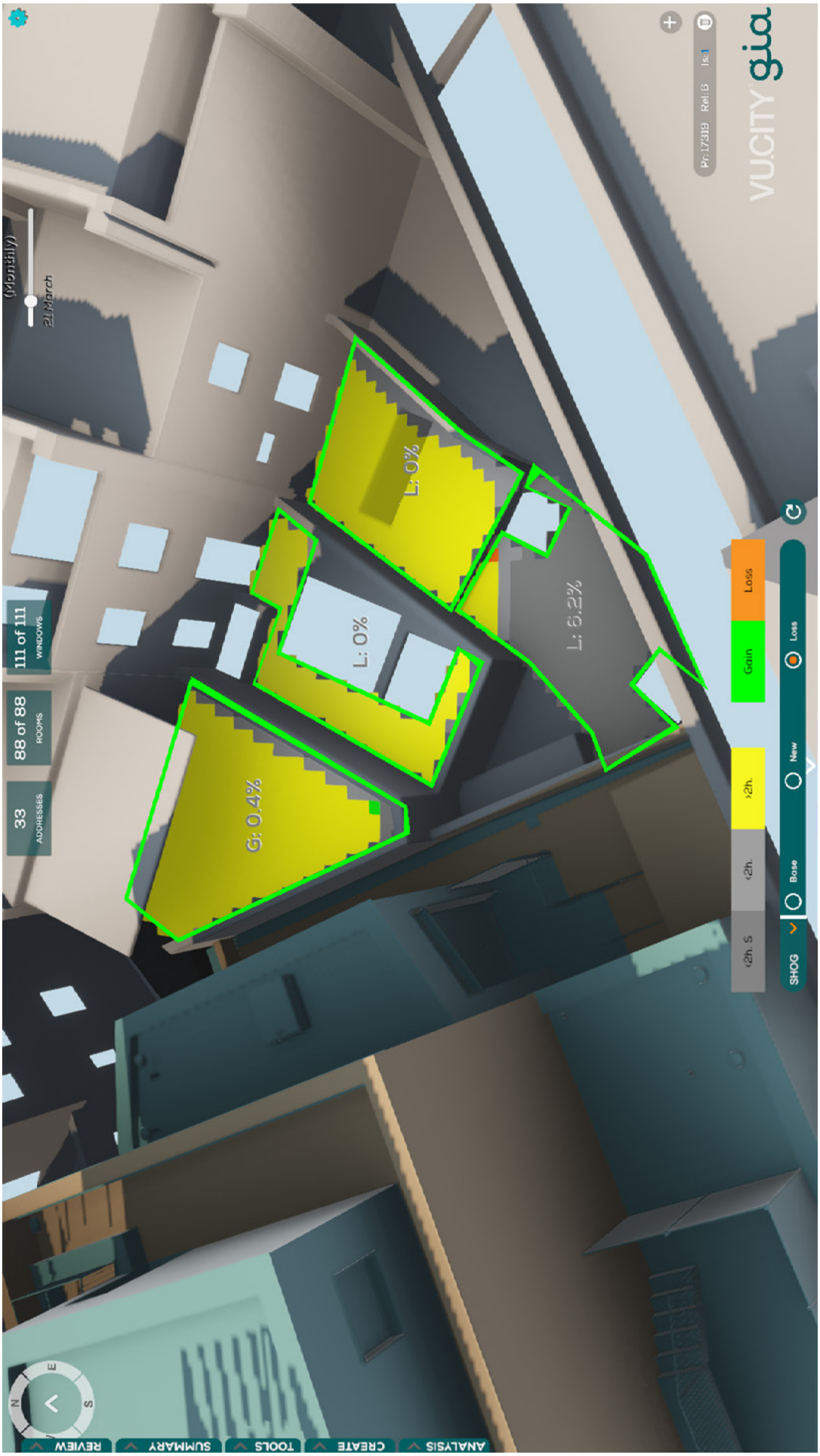

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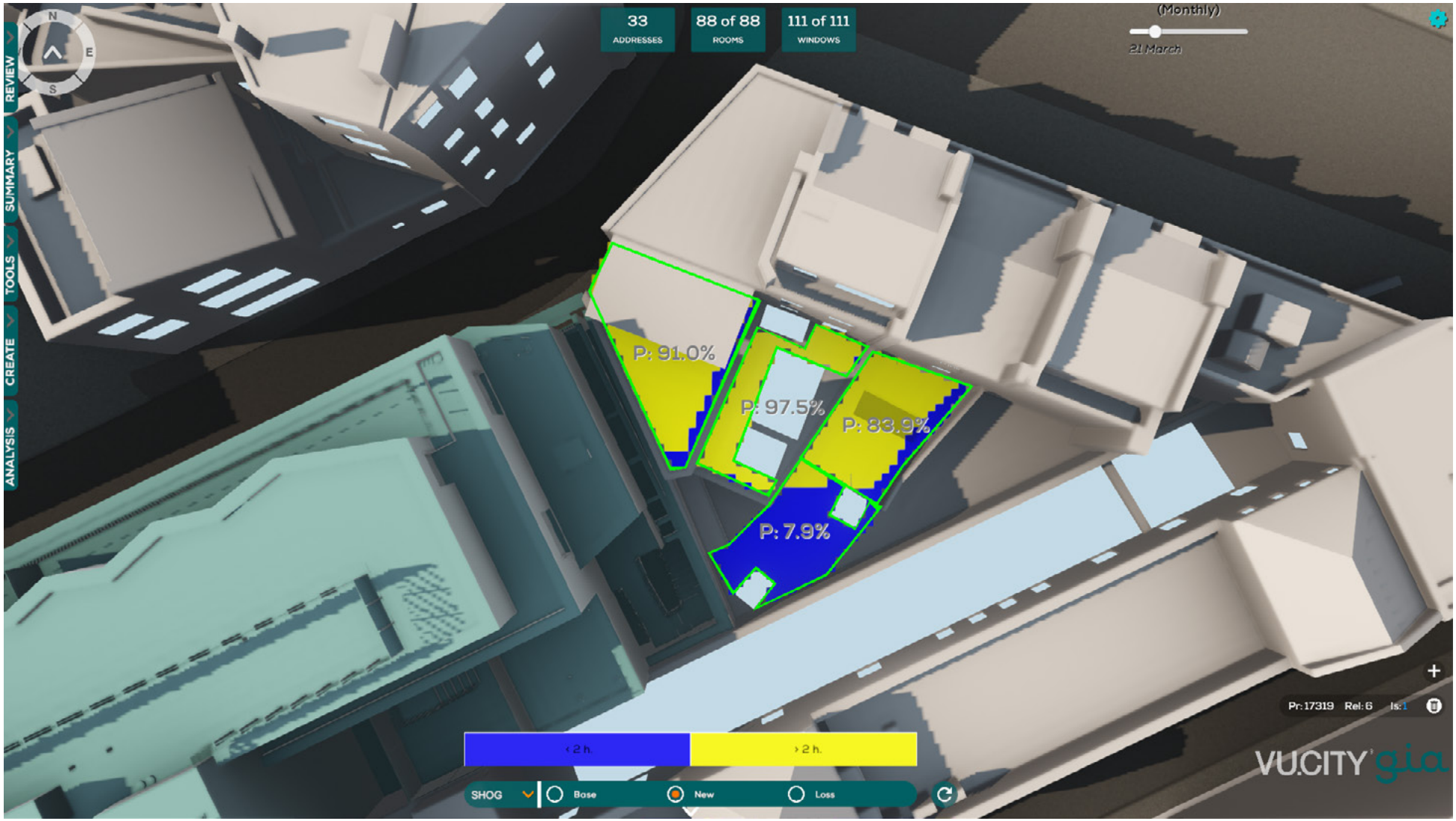
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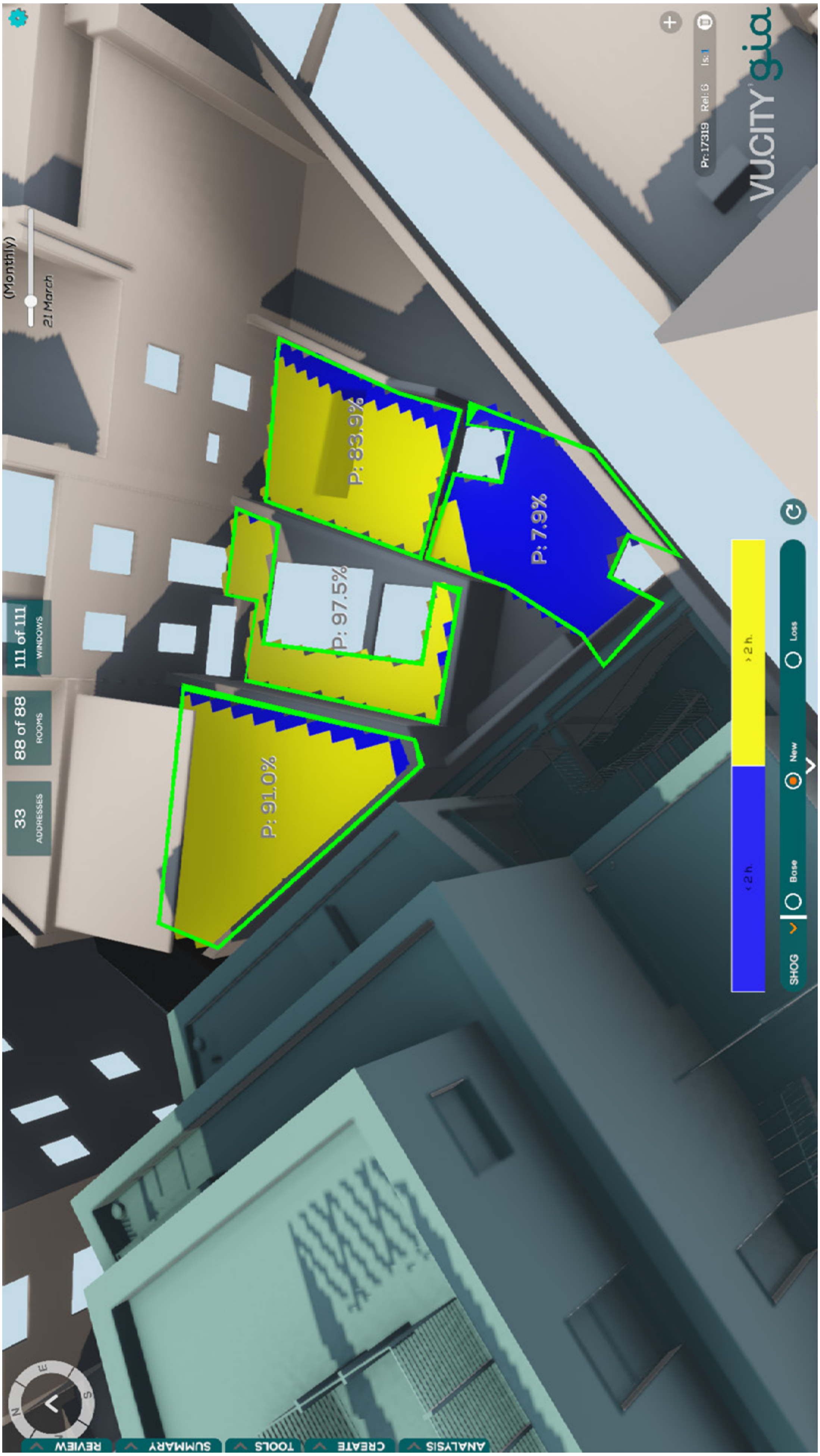
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