

DAYLIGHT IMPACT REPORT: ASSESSMENT OF DAYLIGHT IMPACTS ASSOCIATED WITH A PROPOSED RESIDENTIAL DEVELOPMENT ON RAVENS ROCK ROAD, SANDYFORD, DUBLIN 18.

Daylight Report 1 of 3

Prepared for Ravensbrook Limited

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Glossary

Annual Probable Sunlight Hours (APSH)	the long-term average of the total number of hours during the year in which direct sunlight reaches the unobstructed ground (when clouds are considered)
Daylight	combined sunlight and skylight
Skylight	part of solar radiation that reaches the earth's surface as a result of scattering in the atmosphere.
Sunlight	part of solar radiation that reaches the earth's surface as parallel rays after selective attenuation by the atmosphere.
Vertical Sky Component	ratio of the part of illuminance, at a point on a given vertical plane, that is received directly from a CIE (Commission Internationale De L'Eclairge) standard overcast sky, to illuminance on a horizontal plane due to an unobstructed hemisphere of this sky. The VSC does not include reflected light, either from the ground or from other buildings
Winter Probable Sunlight Hours (WPSH)	the long-term average of the total number of hours between the 21 st of September and the 21 st of March in which direct sunlight reaches the unobstructed ground (when clouds are considered)

Introduction

BPG3 have been engaged by Ravensbrook Limited to carry out an early-stage assessment of the daylight levels associated with a proposed residential development on Raven's Rock Road, Dublin 18.

The proposal relates to the construction of a built-to-rent residential development comprising 101 no. apartments including internal and external amenity space, car and bicycle parking, public open space site wide landscaping and all associated services and infrastructure required to facilitate the development.

This assessment has been carried out with reasonable and appropriate regard to the methods presented in the BRE (Building Research Establishment) guide 'Site layout planning for daylight and sunlight – A guide to good practice' 2nd Edition. The assessment responds to point 5 of the opinion received from An Bord Pleanála:

“Relevant reports/drawings etc that considers the impact of the proposed development on the development potential of neighbouring sites and consideration of any potential impacts of adjacent development on the amenity of future occupiers of this proposed development.”

The assessment investigates the degree to which the proposed development would impact on the levels of daylight available to neighbouring properties. The assessment of light levels within the proposed development is presented in separate reports; see Daylight Report 2 of 3 and Daylight Report 3 of 3.

A total of three separate daylight studies are presented in this report. These studies include:

Study A: Assessment of skylight access levels available to neighbouring accommodation: An assessment of the extent to which the proposed development could impact on the skylight access levels available to the accommodation located in neighbouring properties.

Study B: Assessment of sunlight access levels available to neighbouring accommodation: An assessment of the extent to which the proposed development could impact on the levels of sunlight access available to accommodation in neighbouring residences.

Study C: Assessment of sunlight levels available to neighbouring recreation areas: An assessment of the extent to which the proposed development would impact on the levels of sunlight access available to neighbouring outdoor recreation areas.

As recommended in the BRE guide, a quantitative approach to the assessment of daylight impacts has been adopted in this study. Numeric calculations have been carried out to predict the daylight levels which would be available at a number of test points and areas. The results of these calculations are presented in tables.

The quantitative assessment has been carried out using computational methods. Three-dimensional computer models of the existing site, the existing buildings, and the proposed development have all been generated and simulated under appropriate sky conditions.

As is customary, impacts have been assessed by comparing the levels of light which would be available in an after-development scenario to the levels which would be provided in a baseline scenario. The baseline scenario adopted in this case is illustrated in Figure 1; the after-development scenario is illustrated in Figure 2.

Information relating to the proposed development and the surrounding areas has been supplied to BPG3 by Henry J Lyons in electronic format. The study assumes that the information provided is accurate and that no omissions have been made. The particular information sources which have been used to develop the models used in this study are outlined in Appendix D: Source Material.

In accordance with guidance provided in Appendix H of the BRE guide the effect which trees have on light levels has not been considered in this impact assessment.

It is important to note that whilst the methods presented in the BRE guide provide designers and planners with a clear and objective way of assessing daylight levels, the associated performance targets are not mandatory standards. This is clarified within the introductory section of the BRE guide:

“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.”

While it is accepted that advisory targets should always be aspired to, the associated imperatives which exist to create sustainable levels of urban density, to encourage the development of compact urban form and to make best use of scarce urban land will always place restrictions on the degree to which it is appropriate to pursue full conformity with advisory minimums.

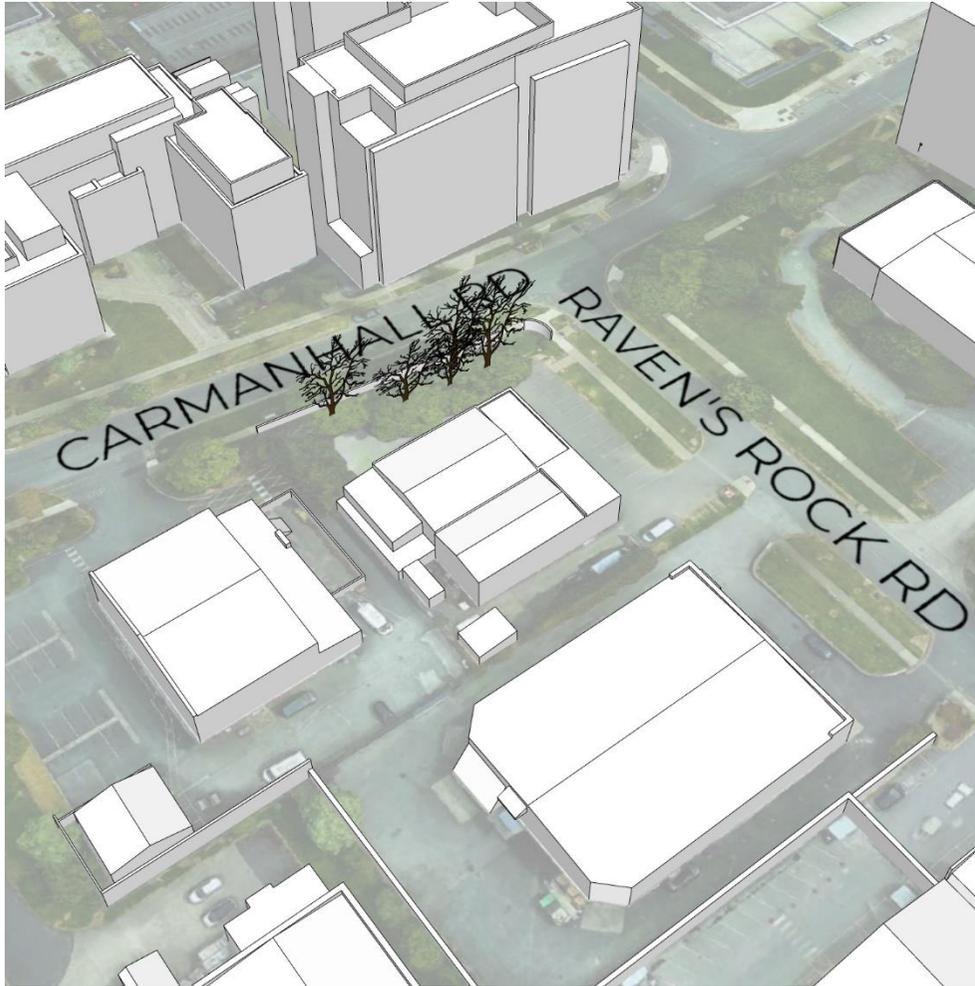


Figure 1 Image depicting the baseline scenario adopted in all impact assessments

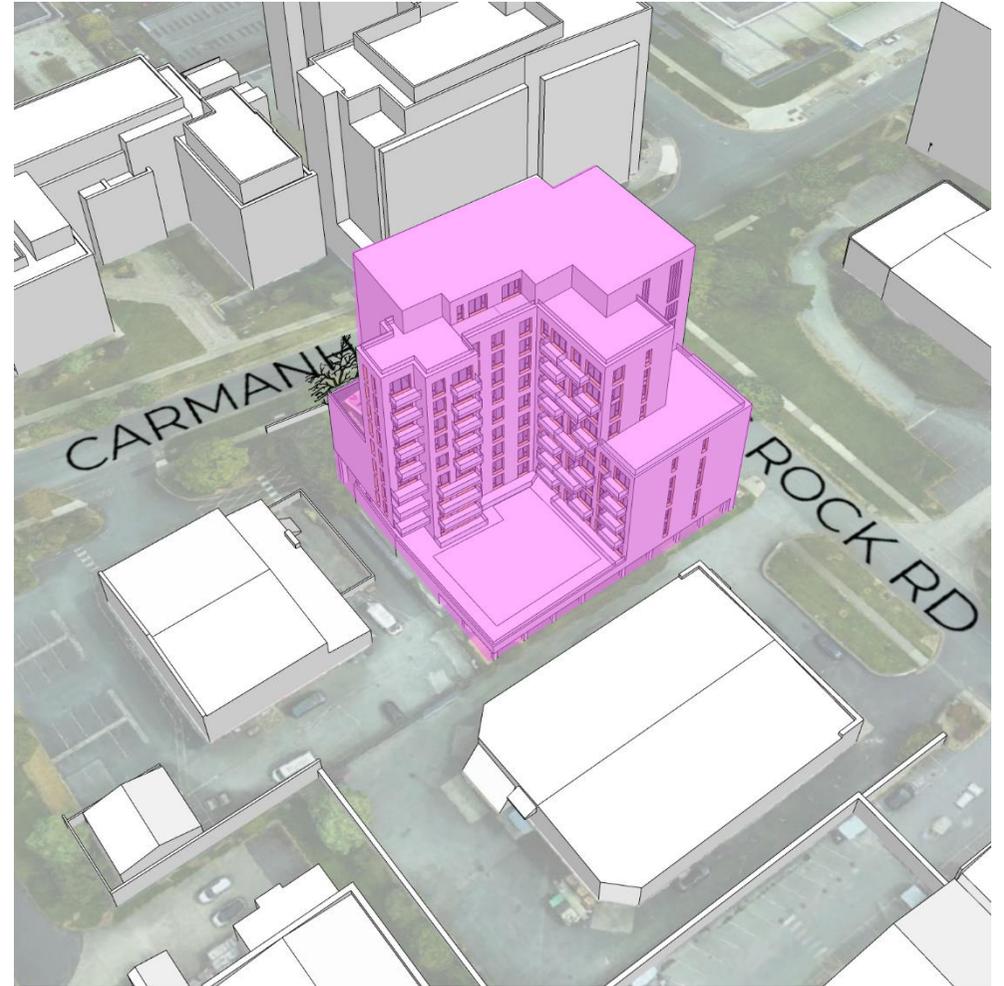


Figure 2 Image depicting the after-development scenario adopted in all impact assessments (proposed development highlighted in pink).

In instances where it can be shown that reasonable levels of daylight would be retained, or in instances where the impacts registering are determined to be of reduced significance, it is BPG3's view that a justifiable basis, for accepting light levels which fall below advisory minimums, will have been established. It is on this basis that both a primary assessment (as ascertained with reference to conventional testing) and secondary assessments (based on a professional opinion/interpretation which is informed by wider considerations) have been provided within this report. BPG3 recommends that the merits of the secondary assessments should only be considered having first considered the findings of the primary assessments. A deeper consideration of primary and secondary assessments is provided in Appendix C: Primary / Secondary Assessments.

The framework which BPG3 adopts to determine the significance of impacts is presented in Appendix E: Conventions used to Assess the Significance of Impacts. Where significant impacts are identified these impacts should also be deemed acceptable in instances where wider planning objectives countervail. Guidance regarding the discretion which is available to consent authorities on this matter is provided in Appendix B: Discretion available to consent authorities.

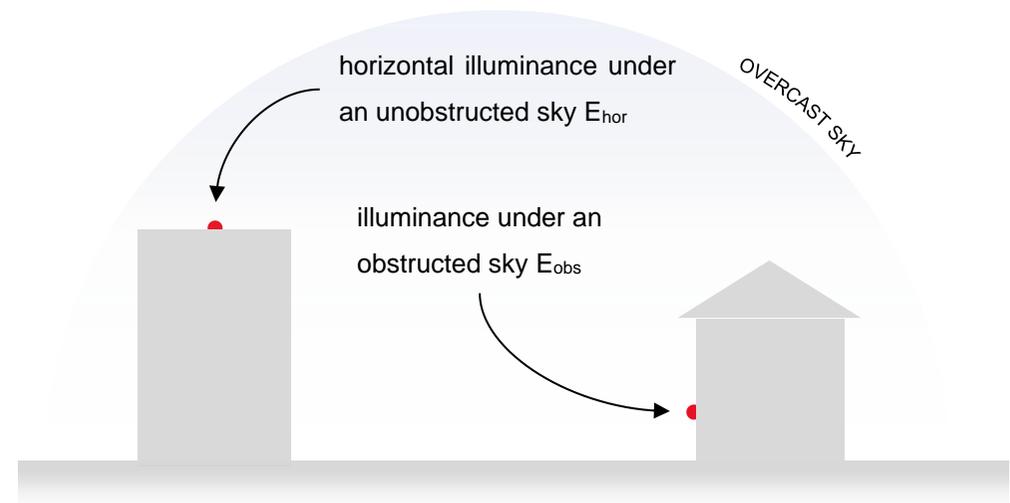
Study A: Assessment of skylight levels available to neighbouring accommodation

Study A: Assessment Overview

This assessment considers the degree to which the proposed development would affect the levels of diffuse skylight which would be available to neighbouring accommodation.

As recommended in national planning guidance¹ the assessment is carried out in the first instance with regard to the conventional tests recommended in the BRE guide '*Site layout planning for daylight and sunlight – A guide to good practice*' 2nd Edition.

According to the BRE guide, the potential for good daylighting can be assessed with respect to a measure called the Vertical Sky Component. The Vertical Sky Component is described as *the ratio of the direct sky illuminance falling on the vertical wall at a reference point, to the simultaneous horizontal illuminance under an unobstructed sky*; see below. When calculating VSC the sky is assumed to be a CIE standard overcast sky and reflected light from the ground or neighbouring obstructions is not accounted for.



$$VSC = \frac{E_{obs}}{E_{hor}} \times 100\% \quad \text{equation 1.}$$

VSC is tested at a point which is taken to be positioned in the middle of the window being analysed and located on the same plane as the external surface of the attendant wall.

The BRE recommends that the potential for good daylighting exists where a Vertical Sky Component of 27% or higher is available to the windows serving habitable accommodation. In instances where impact on neighbouring

¹ See Appendix A: Policy Basis for Daylight Standards

properties is being assessed the BRE provide the following recommendation:

'If the vertical sky component, with the new development in place, is both less than 27% and 0.8 times its former value, then the occupants of the existing building will notice a reduction in the amount of skylight.'

In certain circumstances supplementary testing is carried out to investigate the significance of the results produced by conventional BRE testing.

In the circumstances of this project the assessment has been extended to include a consideration of the skylight access which would be available to accommodation located within future development on neighbouring sites.

Study A: Assessment Points

Within the BRE guidelines the type of accommodation which qualifies for assessment includes the habitable rooms within residential properties (living room, kitchen, bedroom etc.) as well non-domestic accommodation where the occupants have a reasonable expectation of daylight. The BRE advise that occupants within schools, hospitals, hotels, hostels, small workshops, and some offices would generally have a reasonable expectation of daylight.

In the circumstances of this project the development proposed is surrounded by commercial buildings. On the basis that the activities conducted within

these buildings can be described as either conventional office work or conventional light industrial work (activities to which BRE criteria are not generally applicable) the properties in question fall beyond the scope of this assessment.

Consideration has been given to two recently permitted residential developments (one on the former Aldi site, Carmanhall Road ABP30594019 and the other on the Avid Technology site, Carmanhall Road ABP 30346719). In both cases BPG3 has determined that the permitted developments would be located too far away from the proposed development to be capable of experiencing recognisable impacts. It is on this basis that these properties have not been included within this impact study.

Having regard to the above it has not been possible to identify any windows in the neighbourhood (either within existing or recently permitted properties) which qualify for testing within this study.

Notwithstanding the above, the assessment has been expanded to consider the degree to which the accommodation located within notional future developments, on adjacent sites, would be able to a secure adequate skylight access. The future developments assumed for this exercise are detailed in Appendix H: Assumed Future Neighbouring Developments.

Study A: Results

As the development in question is not located close to buildings which qualify for assessment it follows, within the meaning of the BRE guide, that no significant impacts can be reasonably anticipated.

When the assessment is extended to consider the degree to which accommodation located within notional future developments, on adjacent sites, would be capable of accessing adequate skylight access, the results obtained are broadly positive. Assuming the units present within the future development on neighbouring sites are designed with reasonable regard to the principles of good daylighting, predictions indicate that good levels of internal daylighting would be generally achievable; see Appendix I: Skylight available to neighbouring future developments .

Study B: Assessment of sunlight levels available to neighbouring living rooms

Study B: Assessment Approach

Sunlight access is assessed with respect to a measure called Annual Probable Sunlight Hours (APSH). This measure relates to the total number of hours in the year that the sun is typically expected to shine on unobstructed ground, allowing for average levels of cloudiness for the location in question.

According to the BRE guide a dwelling, or non -domestic building which has a particular requirement for sunlight, will appear reasonably sunlit provided:

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

Further to this the BRE advise that the sunlighting of existing dwellings may be adversely affected if the centre of the window in question:

- Receives less than 25% of annual probable sunlight hours, or less than 5% of annual probable sunlight hours between the 21st of September and the 21st of 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.

Study B: Assessment Points

Within the BRE guidelines the type of accommodation which qualifies for assessment includes the habitable rooms within residential properties (living room, kitchen, bedroom etc.) as well non-domestic accommodation where the occupants have a reasonable expectation of daylight. The BRE advise that occupants within schools, hospitals, hotels, hostels, small workshops, and some offices would generally have a reasonable expectation of daylight.

In the circumstances of this project the development proposed is surrounded by commercial buildings. On the basis that the activities conducted within these buildings can be described as either conventional office work or conventional light industrial work (activities to which BRE criteria are not generally applicable) the properties in question fall beyond the scope of this assessment.

Consideration has been given to two recently permitted residential developments (one on the former Aldi site, Carmanhall Road ABP30594019 and the other on the Avid Technology site, Carmanhall Road ABP 30346719). In both cases BPG3 has determined that the permitted developments would be located too far away from the proposed development to be capable of experiencing recognisable impacts. It is on

this basis that these properties have not been included within this impact study.

Having regard to the above no windows, either within existing neighbouring properties or permitted neighbouring properties (yet to be constructed), have been assessed within this study.

Notwithstanding the above, the assessment has been expanded to consider the degree to which the accommodation located within notional future developments, on adjacent sites, would be able to secure adequate sunlight access. The future developments assumed for this exercise are detailed in Appendix H: Assumed Future Neighbouring Developments.

Study B: Results

As the proposed development is not located close to buildings which qualify for assessment it follows, within the meaning of the BRE guide, that no significant impacts can be reasonably anticipated.

When the assessment is extended to consider the degree to which accommodation located within notional future developments, on adjacent sites, would be capable of accessing adequate levels of sunlight, the results predicted are broadly positive. On the assumption that the internal layouts of dual aspect apartments are carefully organised, results indicate that the potential exists for adequate levels of sunlighting to be achieved throughout; see Appendix J: Annual sunlight available to neighbouring future

developments and Appendix K: Winter sunlight available to neighbouring future developments .

Study C: Assessment of sunlight levels available to neighbouring recreation areas.

Study C: Assessment Approach

The BRE recommends that a garden or amenity area will appear adequately sunlit throughout the year if at least half of it can receive at least two hours of sunlight on the 21st of March.

When impacts are being assessed the BRE advises that a noticeable loss of sunlight will register on a neighbouring recreation space if as a result of a new development less than 50% of the area is capable of receiving 2hrs of sunshine on the 21st of March and the area which is capable of receiving two hours is less than 0.8 times its former value.

In order to assess a particular amenity space an analysis grid is specified across its area. At each point on this grid the cumulative number of sunlight hours registering are calculated for the course of a specified day (21st of March). The percentage of the assessed area which receives more than 2 hours of sunlight on that day is then obtained.

Study C: Assessment Areas

The BRE recommends that the availability of sunlight should be checked for all open spaces where it would be required and that this would normally include:

- Gardens, usually the main back garden of a house
- Parks, playing fields
- Children's playground
- Outdoor swimming pools and paddling pools
- Sitting out areas such as those between non-domestic buildings and in public squares
- Focal points for views such as a group of monuments or fountains

A survey of the neighbouring environment identifies one neighbouring outdoor recreation space where altered sunlighting levels could potentially register, see Figure 3.

The assessment has also been expanded to consider the degree to which the outdoor recreation spaces serving notional future developments, on adjacent sites, would be able to secure adequate solar access. The future developments assumed for this exercise are detailed in Appendix H: Assumed Future Neighbouring Developments. For the purpose of this exercise four outdoor recreation spaces have been considered including one area of public amenity space (located to the north) and three areas of communal outdoor space (located at podium and roof level); Appendix L: Solar access available to neighbouring future developments.

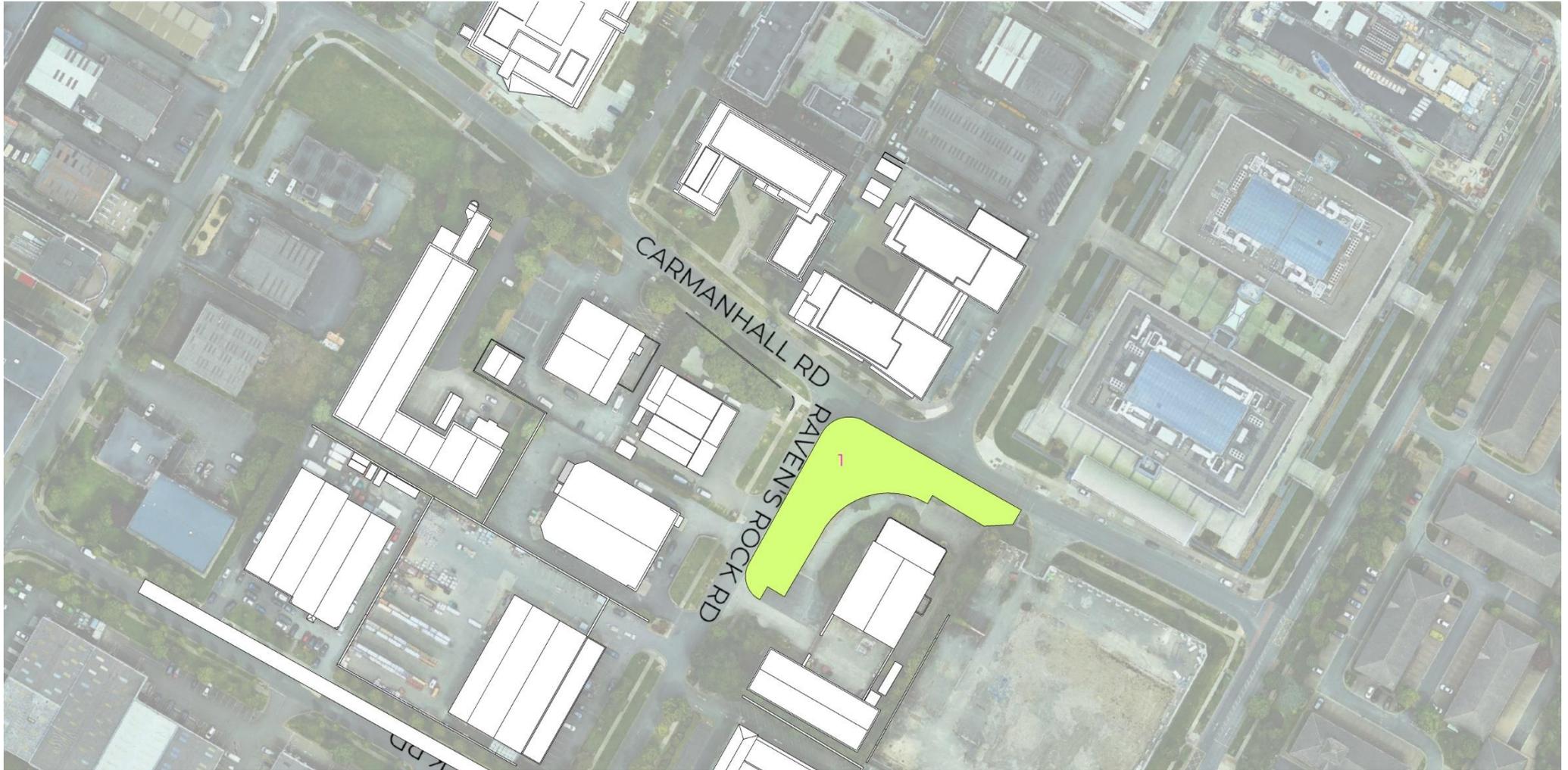


Figure 3 Plan showing the neighbouring recreation spaces which have been assessed in this study

Study C: Results

This study has assessed the degree to which the proposed development would impact on the levels of sunlight available to an outdoor space located to the east of the proposed development. Numeric results are presented in Table 1, the associated solar distribution diagrams are presented in Figure 4 & Figure 5. Supplementary shadow casting imagery has been included within Appendix G: Shadow Casting Imagery.

The results of this study (see Table 1) indicate that full compliance with BRE guidelines would be achieved. The outdoor recreation space tested in this study satisfies the advisory minimums recommended by the BRE; it follows that no significant impacts can be reasonably anticipated.

When the assessment is extended to consider the degree to which outdoor recreation spaces, serving notional future developments on adjacent sites, would be capable of accessing adequate sunlight the results obtained indicate that conformance with BRE guidelines is achievable in most cases; see Appendix L: Solar access available to neighbouring future developments. Of the four areas considered three are found to achieve full conformity with guidelines. In the singular instance where it has not been possible to demonstrate full conformity with BRE guidelines on the recommended test day (21st of March), it has been possible to show that increased levels of sunlight would be available during summer months, see Appendix L: Solar access available to neighbouring future developments.

When the significance of this departure is being considered it is important for wider planning considerations to be recognised.

To the extent that strong street frontage (addressing Carmanhall Rd.) along the established building line represents a countervailing requirement, it follows that the overshadowing of land to the north will be somewhat inevitable.

Supplementary analysis indicates that the additional heights which are being proposed (heights over and above those suggested in the Urban Framework Plan) in this location are not the principal cause of the overshadowing which has been identified. The analysis required to support this finding involved the testing of a capped height development scenario which represents the development forms recommended in the Urban Framework Plan (UFP) for this area. When the results obtained for the proposed/assumed development forms (see Appendix H: Assumed Future Neighbouring Developments) are compared to the capped height development forms (see Figure 21) a significant increase in overshadowing is not observed; see Appendix L: Solar access available to neighbouring future developments. Having carried out this supplementary testing it can be concluded with confidence that any reasonably sized development form (heights in alignment with the UFP), addressing Carmanhall Road, will cause overshadowing of lands to the north and that, to a large extent, the additional height which is being proposed on these sites is not causing the departures identified.

Table 1 Sunlight amenity levels available to neighbouring outdoor areas

Area ID	Area Type (A)	BRE Testing of Solar Access Levels				Professional Interpretation of Solar Access Levels			
		% Area capable of receiving at least 2hrs of sunshine on the 21st of March			BRE Compliance Demonstrated?	Magnitude of Impact (C)	Sensitivity of Area to Impact (C)	Significance of Impact (C)	Professional Opinion (<i>see notes at end of table for expanded explanation</i>)
		Existing	Advisory Minimum (B)	Proposed					
1	O	100%	50%	100%	Yes	Negligible	Medium/High	Negligible	<i>Reasonable solar access retained (d)</i>

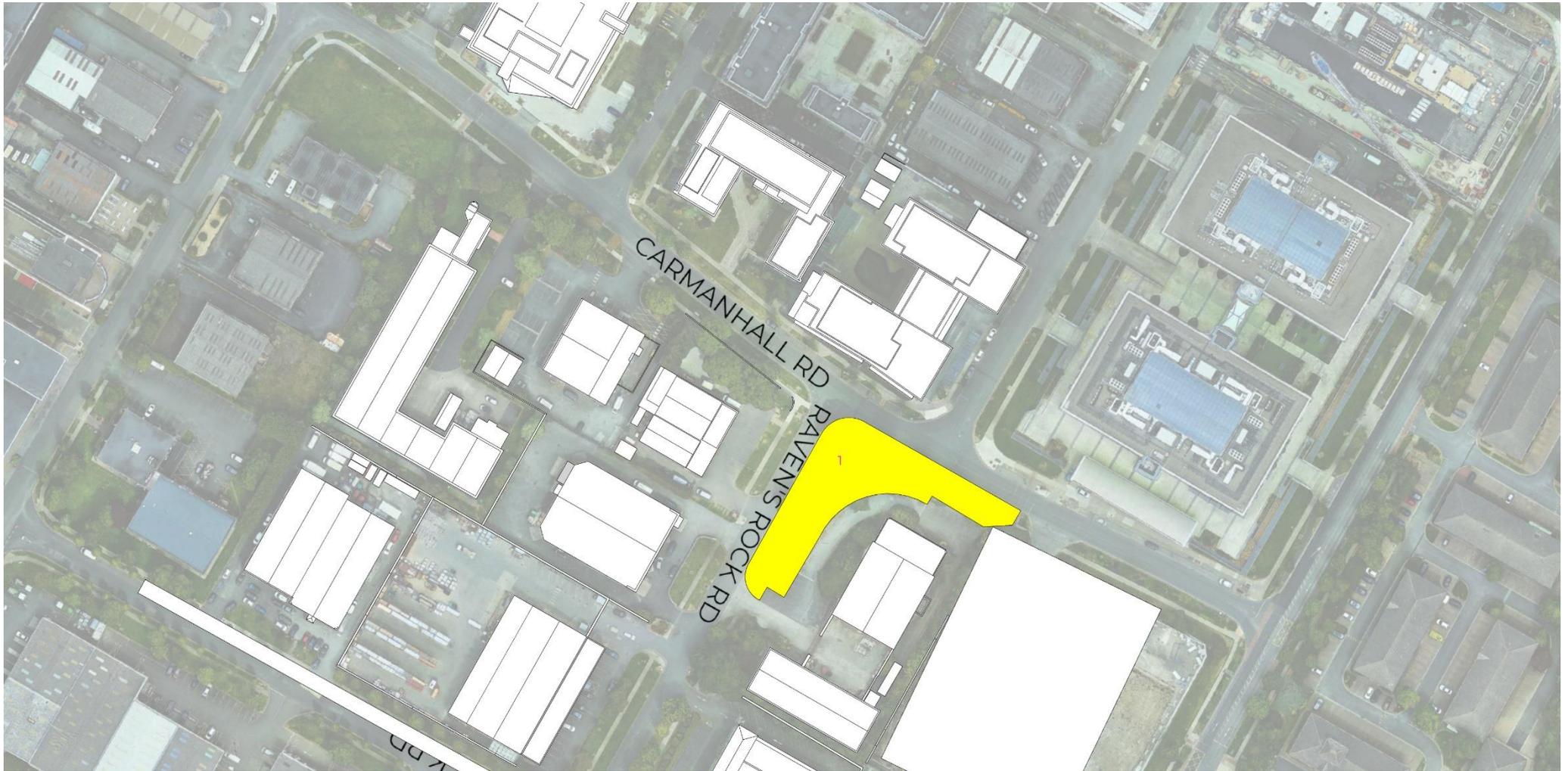
(A) *See Appendix E: Conventions used to Assess the Significance of Impacts for Area Type codes*

(B) *Advisory minimum is 50% unless 0.8 times former value is lower*

(C) *The framework used to classify impacts is described within Appendix E: Conventions used to Assess the Significance of Impacts*

(d) *On the basis that full compliance with BRE guidelines has been demonstrated it is safe to assume that a reasonable level of solar access would remain available with the proposed development in place.*

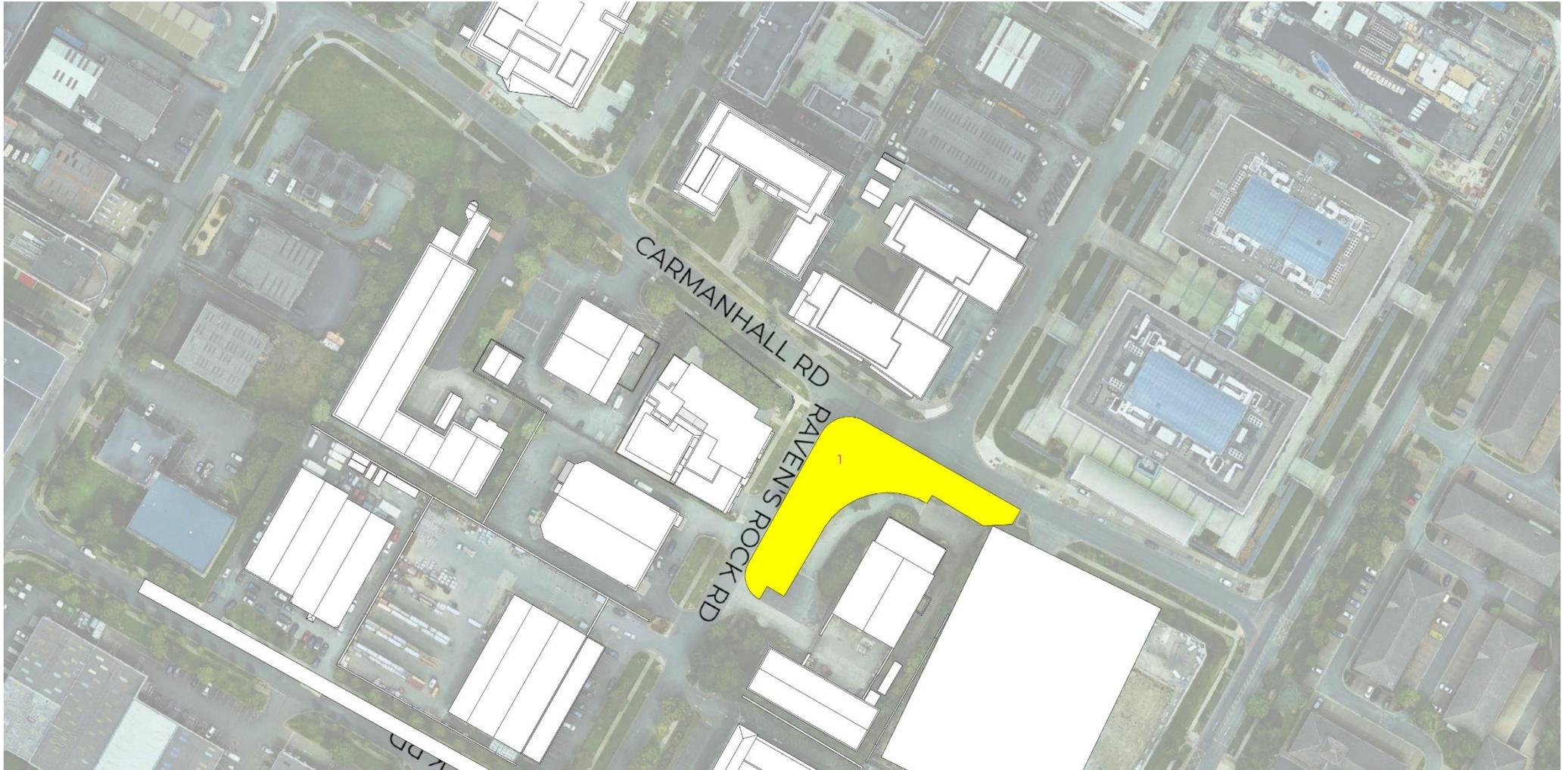
Figure 4 Solar access distribution predicted for neighbouring recreation spaces (Existing Scenario). Areas highlighted in yellow can receive at least 2hrs of sunshine on the 21st of March



TOTAL NO. SUNLIGHT HOURS ON THE 21ST OF MARCH (HRS)



Figure 5 Solar access distribution predicted for neighbouring recreation spaces (Proposed Scenario). Areas highlighted in yellow can receive at least 2hrs of sunshine on the 21st of March



TOTAL NO. SUNLIGHT HOURS ON THE 21ST OF MARCH (HRS)



The Importance of Interpreting Daylight Results Flexibly

As outlined in the BRE guide, the results presented in this report should be interpreted with a degree of flexibility. The flexibility available in the BRE guide is outlined in the introductory section as follows:

“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 targets these should be interpreted flexibly because natural lighting is only one of many factors in site layout design.”

This approach is also supported by recently published ministerial guidelines. Specific guidance is provided within Section 3.2 of the DoHPLG Building Height Design Guidelines 2018:

“Where a proposal may not be able to fully meet all the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, in respect of which the planning authority or An Bord Pleanála should apply their discretion, having regard to local factors including specific site constraints and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution.”

Conclusions

This report has been prepared to assess the daylight levels associated with a proposed development on Ravens Rock Road, Sandyford, Dublin 8. More specifically this report considers the effect that the proposed development would have on the light levels available to neighbouring properties. A consideration of the light levels which would be available to future developments, on neighbouring sites, has also been included. The light levels which would be provided within the proposed development are reported separately, see Daylight Reports 2 of 3 and 3 of 3.

In assessing the significance of the daylight levels which have been predicted for this development it is important to bear a number of factors in mind.

In the first instance it is clear that this development conforms to and experiences many of the typical issues which arise when developments are proposed on urban sites. Having regard to the governments stated aims to support an increase in housing supply and to encourage sustainable development patterns, it is reasonable to propose that lands located at close proximity to urban centres must now be developed at higher densities. It is in this regard that it may not now always be appropriate to pursue full conformity with the guideline targets recommended in the BRE Guide or BS 8206. While care should be taken to ensure that substantial levels of conformity with the recommendations in these guides are achieved, it is often the case that the particulars of a given site place insurmountable restrictions

on the ability of a development to achieve full conformity at all points of assessment. In this regard it is important to weigh up the isolated cases where full conformity with guideline targets has not been satisfied against the broader benefits which a development can provide to the compactness, vitality and viability of an urban neighbourhood.

In conducting this assessment regard has been paid to the recommendations provided in the BRE guide '*Site layout planning for daylight and sunlight – A guide to good practice*' 2nd Edition and BS 8206-2: 2008 – '*Lighting for Buildings – Part 2: Code of Practice for Daylighting*', British Standards Institute. A number of component studies have been carried out.

Within these guides three specific tests have been identified which relate to the assessment of impact on neighbouring properties. The findings from these studies are reported in the following paragraphs.

Study A assessed the impact that the proposed development would have on the levels of skylight access which would be available to neighbouring windows. In the circumstances of this project, no windows on neighbouring properties have been found to qualify for assessment (the development is surrounded by commercial properties); it follows, within the meaning of the BRE guide, that no significant impacts can be reasonably anticipated. When the assessment is extended to consider the degree to which accommodation, located within notional future developments on adjacent

sites, would be capable of accessing adequate skylight access, the results obtained are broadly positive.

Study B assessed the impact that the proposed development would have on the levels of sunlight access which would be available to neighbouring windows. In the circumstances of this project, no windows on neighbouring properties have been found to qualify for assessment (the development is surrounded by commercial properties); it follows, within the meaning of the BRE guide, that no significant impacts can be reasonably anticipated. When the assessment is extended to consider the degree to which accommodation located within notional future developments, on adjacent sites, would be capable of accessing adequate levels of sunlight, the results predicted are broadly positive. On the assumption that the internal layouts of dual aspect apartments are carefully organised the potential exists for adequate levels of sunlighting to be achieved throughout.

Study C assessed the impact that the proposed development would have on the levels of sunlight available to a neighbouring recreation area. In this case full compliance with BRE guidelines has been demonstrated. It follows that no significant loss of sunlight amenity can be reasonably anticipated. When the assessment is extended to consider the degree to which outdoor recreation spaces serving notional future developments, on adjacent sites, would be capable of accessing adequate solar access the results obtained indicate that conformance with BRE guidelines would be achievable in most cases. In the singular instance where overshadowing is identified it has been

possible to show that the departure predicted is, to a large extent, an inevitable consequence of creating appropriate street frontage along Carmanhall Road.

When assessed in the round it is reasonable to conclude that the development proposed demonstrates substantial levels of conformity with daylight guidelines. In making best use of this site, it is inevitable that some departures from advisory targets will be encountered; provision is made within current planning policy to accommodate departures of this nature in instances where wider planning objectives countervail, see Appendix B: Discretion available to consent authorities.

Appendix A: Policy Basis for Daylight Standards

The particular provisions which have been made to promote good daylighting in planning guidance are identified as follows:

Sustainable Residential Development in Urban Areas, DoEHLG 2009

Published by the Department of Environment Housing and Local Government in 2009, this guide includes a number of provisions related to daylight. Section 7.9 of the guide is particularly relevant:

“7.9 – Overshadowing will generally only cause problems where buildings of significant height are involved or where new buildings are located very close to adjoining buildings. Planning authorities should require that daylight and shadow projection diagrams be submitted in all such proposals. The recommendations of “Site Layout Planning for Daylight and Sunlight: A Guide to good Practice” (BRE 1991) or BS 8206 “Lighting for Buildings, Part 2 1992: Code of Practice for Daylighting” should be followed in this regard.”

Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities

Published by the Department of Environment Housing and Local Government in March 2018, provisions are made to safeguard daylight within Section 6.6 and 6.7:

“6.6 – Planning authorities should have regard to quantitative performance approaches to daylight provision outlined in guides like the BRE guide ‘Site Layout Planning for Daylight and Sunlight’ (2nd Edition) or BS 8206-2:2008 – ‘Lighting for Buildings – Part 2: Code of Practice for Daylighting’ when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision.

6.7 – Where an applicant cannot fully meet all of the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, which planning authorities should apply their discretion in accepting taking account of its assessment of specific. This may arise due to a design constraint associated with the site or location and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution.”

Urban Development and Building Heights – Guidelines for Planning Authorities

Published by the Department of Environment Housing and Local Government in March 2018, provisions are made to safeguard daylight within Section 3.2. The specific guidance is provided within the part of Section 3.2 which deals with development management at the scale of the site/building:

“At the scale of the site/building

- *The form, massing and height of proposed developments should be carefully modulated so as to maximise access to natural daylight, ventilation and views and minimise overshadowing and loss of light.*
- *Appropriate and reasonable regard should be taken of quantitative performance approaches to daylight provision outlined in guides like the Building Research Establishment’s ‘Site Layout Planning for Daylight and Sunlight’ (2nd edition) or BS 8206-2: 2008 – ‘Lighting for Buildings – Part 2: Code of Practice for Daylighting’.*
- *Where a proposal may not be able to fully meet all the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, in respect of which the planning authority or An Bord Pleanála should apply their discretion, having regard to local factors including specific site constraints and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution.”*

Appendix B: Discretion available to consent authorities

Irish planning policy advises that in instances where it is not possible to demonstrate full conformity with advisory minimums consent-authorities are entitled to accept departures where other planning objective are found to countervail.

Specific guidance on this matter is provided within Section 4.5 the National Planning Framework² (Section 4.5). The guidance provided is as follows:

“To enable brownfield development, planning policies and standards need to be flexible, focusing on design led and performance-based outcomes, rather than specifying absolute requirements in all cases. Although sometimes necessary to safeguard against poor quality design, planning standards should be flexibly applied in response to well-designed development proposals that can achieve urban infill and brownfield development objectives in settlements of all sizes. This is in recognition of the fact that many current urban planning standards were devised for application to greenfield development sites and

cannot account for the evolved layers of complexity in existing built-up areas.” [Emphasis added]

The NPF goes further and introduces the need for tolerances and alternative solutions as a National Policy Objective. National Policy Objective 13 of the NPF is stated as follows:

*“In urban areas, planning and related standards, including in particular building height and car parking will be based on performance criteria that seek to achieve well-designed high-quality outcomes in order to achieve targeted growth. **These standards will be subject to a range of tolerance that enables alternative solutions to be proposed to achieve stated outcomes, provided public safety is not compromised and the environment is suitably protected.**” [Emphasis added]*

On the basis that this guidance is applicable to daylight standards it is reasonable to propose that a clear basis exists for the consent authorities to accept shortfalls from advisory minimums in instances where a countervailing planning objective exists.

Additional support for this facility is provided within the Urban Design Manual published by the Department of Energy Heritage and Local Government, 2009. On page 43 of this manual the following guidance is provided:

² DoHPLG 2018 National Planning Framework

“Where design standards are to be used (such as the UK document Site Layout Planning for Daylight and Sunlight, published by the BRE), it should be acknowledged that for higher density proposals in urban areas it may not be possible to achieve the specified criteria, and standards may need to be adjusted locally to recognise the need for appropriate heights or street widths.” [Emphasis added]

The need for tolerance and flexibility to be exercised when interpreting the significance of daylight results is reflected in the wording which has been adopted in recent building height guidelines³. Specific guidance is provided within Section 3.2 of the guidelines:

“At the scale of the site/building

- The form, massing and height of proposed developments should be carefully modulated so as to maximise access to natural daylight, ventilation and views and minimise overshadowing and loss of light.*
- **Appropriate and reasonable regard** should be taken of quantitative performance approaches to daylight provision outlined in guides like the Building Research Establishment’s ‘Site Layout Planning for Daylight and Sunlight’ (2nd edition) or BS 8206-2: 2008 – ‘Lighting for Buildings – Part 2: Code of Practice for Daylighting’.*

³ DoHPLG 2018 – Urban Development and Building Heights – Guidelines for Planning Authorities

- **Where a proposal may not be able to fully meet all the requirements of the daylight provisions above, this must be clearly identified and a rationale for any alternative, compensatory design solutions must be set out, in respect of which the planning authority or An Bord Pleanála should apply their discretion, having regard to local factors including specific site constraints and the balancing of that assessment against the desirability of achieving wider planning objectives. Such objectives might include securing comprehensive urban regeneration and or an effective urban design and streetscape solution.” [Emphasis added]***

Appendix C: Primary / Secondary Assessments

Both the Building Height Guidelines⁴ and the Apartment Guidelines⁵ ask that efforts must be made to clearly identify instances where it has not been possible to fully meet all the requirements/recommendations of relevant daylight standards.

It is BPG3's view that this requirement is satisfied within this report in the following way:

- All tests have been carried out on a quantitative basis against the most sensible/obvious interpretation of the guidelines
- The numeric outputs of this quantitative testing are presented within tables.
- In instances where the light levels predicted do not satisfy the advisory minimums recommended in daylight guidelines this is clearly identified within the tables. All relevant tables include a dedicated column which expresses this status in binary terms.
- Where additional commentary is provided within the results section for each test, these sections generally begin with a consideration of the proportion of instances where conventional advisory minimums have been satisfied.

Having clearly communicated the degree to which the light levels predicted for a given design accord with the conventional advisory minimums detailed in daylight guidelines (primary assessment) BPG3 goes on in many instances to consider the significance/meaning of these primary test results (secondary assessment).

In this regard it is important for the reader to be aware that the professional opinions/interpretations which attend these primary test results go beyond the meaning of the BRE guide in some instance and that the opinions/interpretations expressed are informed by a wider understanding of daylight and its relationship to urban planning.

It is BPG3's view that this approach is necessary as the outputs from conventional daylight testing do not always provide a reliable indication of daylight acceptability. Some of the reasons why this can be true include:

- Many of the test methods detailed in daylight guidelines were originally developed in the late 80's at a time when it was assumed practitioners would conduct their assessments using pencil and paper. For a phenomenon as complex as natural light to be quantified

⁴ Urban Development and Building Height Guidelines for Planning Authorities, issued by the Department of Housing Planning and Local Government in December 2018

⁵ Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities issued by the Department of Housing, Planning and Local Government in December 2020.

using a pencil and paper approach a number of very significant simplifications had to be adopted.

- The simplifications involved in conventional daylight testing place limitations on the degree to which results accurately represent the reality of daylight acceptability, as observed by a human observer.
- Further to this BPG3 is aware of certain scenarios where the simplifications present in conventional test methods produce results which are not only rough approximations of reality but are gross misrepresentations of the reality which would be experienced by a human observer⁶.
- It is also important to recognise that many of the performance targets recommended in daylight guidelines are presented as a one -size-fits-all indicator of daylight acceptability. It is BPG3's view that daylight requirements are, in practice, very varied and that factors such as the functional use of a space, occupant expectations, as well as wider contextual factors are all capable of acting as upward or downward modifiers to the conventional one-size-fits-all minimums detailed in daylight guidelines.

- Further to this it is important to recognise that the conventional daylight targets recommended in daylight guidelines were set independently, and with little regard for, current planning policy. It is important to note that many of the minimum standards recommended in daylight guidelines were set over thirty years ago at a time when sustainable development and urban consolidation would not have been as pressing a priority as they are today.

For reasons like the above BPG3 maintains that it is important in some instance to offer a professional opinion regarding the significance/meaning of primary test results. Where a basis exists to support the opinion BPG3 will in some instances conclude that light levels are likely to be acceptable even though the conventional minimums detailed in daylight guidelines have not been satisfied.

It is of fundamental importance for a reader to understand that the opinions/interpretations presented within this report are not intended to replace the results/findings of primary testing. In this regard it is advisable for a reader to take care to locate and consider the results of primary testing

⁶ By way of example the BRE's procedure for assessing the adequacy of skylight amenity within affected accommodation is determined with reference to a measure called the Vertical Sky Component (VSC). Before placing too much weight on the meaning of the results obtained in reliance on VSC testing it is important to recognise that this testing ignores many of the factors which contribute in a very direct way to the daylight performance of a room. The factors which this test procedure ignores include window size, room size, room and window orientation as well as the transmittance of window glazing. Further to this VSC only accounts for skylight which travels directly from the sky; the benefit of reflected light is ignored. When testing

impact using VSC the BRE advise that occupants will notice a drop light levels in circumstances where VSC levels drop by more than 20% with the proposed development in place. A very serious shortcoming of impact testing can be observed in instance where the affected room secures most of it's light from secondary sources in the baseline scenario (i.e., very little access to light directly from the sky; most or the light available in baseline scenario is reflected from external surfaces). In this scenario, where direct skylight contributes very little to the daylighting of a space, a 20% drop in VSC is unlikely to be detectable by occupants.

in the first instance. Having first established how well a given design performs against conventional daylight testing it is BPG3's view that it is appropriate to then go on to consider the significance/meaning of primary test results. It is on this basis that BPG3 has included opinions/interpretations within this report. BPG3 would encourage the reader to accept or to reject these opinions/interpretations on their merit.

Appendix D: Source Material

The 3D models used in our analysis were generated using information garnered from the following sources.

Model Elements	Source	Drawing No. / File Name /	Title / Description	Date Issued / Accessed
Proposed Development	HJL	RR-HJL-00-00-DR-A-1010	Ground Floor Plan	15 th October 2021
		RR-HJL-00-00-DR-A-1011	First Floor Plan	15 th October 2021
		RR-HJL-00-00-DR-A-1012	Second Floor Plan	15 th October 2021
		RR-HJL-00-00-DR-A-1013	Third Floor Plan	15 th October 2021
		RR-HJL-00-00-DR-A-1014	Fourth Floor Plan	15 th October 2021
		RR-HJL-00-00-DR-A-1015	Fifth Floor Plan	15 th October 2021
		RR-HJL-00-00-DR-A-1016	Sixth Floor Plan	15 th October 2021
		RR-HJL-00-00-DR-A-1017	Seventh Floor Plan	15 th October 2021
		RR-HJL-00-00-DR-A-1018	Eight Floor Plan	15 th October 2021
		RR-HJL-00-00-DR-A-1019	Ninth Floor Plan	15 th October 2021
		RR-HJL-00-00-DR-A-1020	Tenth Floor Plan	15 th October 2021
				RR-HJL-00-ZZ-DR-A-2001
		RR-HJL-00-ZZ-DR-A-2002	Elevation North	15 th October 2021
Neighbouring Buildings - Site Levels	Land Surveys	D16700-F	Raven's Rock Road, Sandyford	01/04/2021
Macro Landscape and Wider Context	Google Earth	-	-	-

Appendix E: Conventions used to Assess the Significance of Impacts

The impacts identified in this assessment have been classified with reference to the guidance provided in Section 3.7 of the EPA guidance document *'Guidelines on the information to be contained in Environmental Impact Assessment Reports'* 2017 and to Appendix I of the BRE guide *'Site layout planning for daylight and sunlight – A guide to good practice'* 2011.

A justification for why impacts are assessed using the framework outlined below is detailed in Appendix F: Justification for the adoption of expanded impact classification scheme.

As some level of daylight impact is often inevitable, especially where new developments are proposed within urban neighbourhoods, it is often necessary for planning authorities to carry out a balancing exercise between local impacts and wider planning benefits. In striking an appropriate balance between these competing concerns it is often helpful for daylight impact results to be expressed in terms of their significance⁷.

Having regard to the general approach recommended within the EPA guidelines, the significance of the impact registering on each receptor has been evaluated. For the purpose of this assessment the significance of an impact has been determined with reference to both the magnitude of the impact and the sensitivity of the space to change. Both factors are attributed the same weight and significance is determined as a direct product of these

factors. The sensitivity of the space (room/outdoor area) to change is determined with regard to two principal factors including 1) The likelihood that occupants would expect high levels of indoor skylight/sunlight 2) the likelihood that the space would be occupied during daylight hours. The sensitivity rating which is attributed to various different room types when assessing the significance of indoor skylight impacts is presented in Table 3; the sensitivity rating attributed to various rooms when assessing the significance of indoor sunlight impacts is presented in Table 4; the sensitivity rating attributed to various outdoor spaces when assessing the significance of outdoor sunlight impacts is presented in Table 5.

Magnitude of impact is calculated with reference to the relative departure from advisory minimums. It is categorised on a seven-point scale with zero level of departure being categorised as Negligible and departures greater than 40% being categorised as high.

Table 2 Conventions used to categorise the magnitude of impact.

Relative Departure from Advisory Minimum	Magnitude of Impact
No Departure	Negligible
0% to 8%	Negligible/Low
8% to 16%	Low
16% to 24%	Low/Medium
24% to 32%	Medium
32% to 40%	Medium/High
>40%	High

⁷ Within the EPA guidelines the significance of an effect is described as “the importance of the outcome of the effects (the consequence of the change)”

Table 3 Sensitivity ratings attribute to various rooms when assessing internal skylight impacts.

ID	Room Type	(A)	(B)	(C)= Product of (A) and (B)
		Likelihood that occupants would expect high levels of indoor skylight amenity	Likelihood that space would be occupied during daylight hours	Sensitivity Rating (Indoor Skylight)
CLR	Communal living space in retirement/care home	High	High	High
RW	Recovery ward in hospital	High	High	High
PLR	Private living space in retirement/care home	High	Medium/High	High
L	Principal living room in dwelling	Medium/High	Medium/High	Medium/High
C	Classroom in primary/secondary school or creche facility	Medium/High	Medium/High	Medium/High
CRB	Café/ Restaurant / Bar where ambiance is particularly reliant on natural light	Medium	Medium/High	Medium
K	Kitchen in dwelling	Medium/High	Medium	Medium
SO	Special office/studio where there is a reliance on natural light to carry out work-based tasks	Medium/High	Medium	Medium
CH	Place of worship	Medium	Low/Medium	Low
CLS	Communal living space in 3 rd level student accommodation	Medium	Medium	Low/Medium
S	Study in Domestic Residence	Medium	Medium	Low/Medium
B	Bedroom in dwelling	Medium	Low/Medium	Low
O	Typical office/studio where natural light is welcomed but not essential for work activities	Low/Medium	Medium	Low
CRBD	Café/ Restaurant / Bar where ambiance does not rely on the presence of natural light	Low	Medium/High	Low
BS	Bedroom in 3 rd level student accommodation	Low/Medium	Low/Medium	Low
RL	Retail space which relies primarily on artificial light for displaying products	Low	Medium	Low
BH	Bedroom in hotel	Low	Low/Medium	Negligible/Low
W	Warehouse / Storage Facility	Negligible/Low	Low	Negligible

Table 4 Sensitivity ratings attribute to various rooms when assessing internal sunlight impacts.

ID	Room Type	(A)	(B)	(C)= Product of (A) and (B)
		Likelihood that occupants would expect high levels of indoor sunlight amenity	Likelihood that space would be occupied during daylight hours	Sensitivity Rating (Indoor Sunlight)
CLR	Communal living space in retirement/care home	Low/Medium	High	Medium
RW	Recovery ward in hospital	Low/Medium	High	Medium
PLR	Private living space in retirement/care home	Low/Medium	Medium/High	Low/Medium
L	Principal living room in dwelling	Low/Medium	Medium/High	Low/Medium
C	Classroom in primary/secondary school or creche facility	Low	Medium/High	Low
CRB	Café/ Restaurant / Bar where ambiance is particularly reliant on natural light	Low	Medium/High	Low
K	Kitchen in dwelling	Low	Medium	Low
SO	Special office/studio where there is a reliance on natural light to carry out work-based tasks	Negligible/Low	Medium	Negligible/Low
CH	Place of worship	Low	Low/Medium	Negligible/Low
CLS	Communal living space in 3rd level student accommodation	Low	Medium	Low
S	Study in Domestic Residence	Low	Medium	Low
B	Bedroom in dwelling	Low	Low/Medium	Negligible/Low
O	Typical office/studio where natural light is welcomed but not essential for work activities	Negligible	Medium	Negligible
CRBD	Café/ Restaurant / Bar where ambiance does not rely on the presence of natural light	Negligible	Medium/High	Negligible
BS	Bedroom in 3rd level student accommodation	Negligible/Low	Low/Medium	Negligible/Low
RL	Retail space which relies primarily on artificial light for displaying products	Negligible	Medium	Negligible
BH	Bedroom in hotel	Negligible/Low	Low/Medium	Negligible/Low
W	Warehouse / Storage Facility	Negligible	Low	Negligible

Table 5 Sensitivity ratings attribute to various outdoor spaces when assessing outdoor sunlight impacts.

Identifier	Type of Outdoor Space	(A)	(B)	(C)=Product of (A) by (B)
		Likelihood that users would expect high levels of outdoor sunlight amenity	Likelihood that space would be occupied during daylight hours	Sensitivity Rating (Outdoor Sunlight)
G	Small Residential Garden	Medium/High	Medium	Medium
Y	Small Residential Yard	Low	Low	Negligible/Low
O	Public Open Space	Medium/High	Medium/High	Medium/High
PS	Playground on school grounds	Medium/High	Medium/High	Medium/High
PP	Playground within public park	Medium/High	High	High

Appendix F: Justification for the adoption of expanded impact classification scheme

Appendix I of the BRE Guide provides guidance on language which should be used to describe impacts. More specifically Section I6 of the BRE guide provides the following advice:

“Where the loss of skylight or sunlight does not meet the guidelines in this book, the impact is assessed as minor, moderate or major adverse.

Factors tending towards a minor adverse impact include:

- *Only a small number of windows or limited area of open space are affected*
- *The loss of light is only marginally outside the guidelines*
- *An affected room has other sources of skylight or sunlight*
- *The affected building or open space only has a low-level requirement for skylight or sunlight*
- *There are particular reasons why an alternative, less stringent, guideline should be applied (see Appendix F).*

Factors tending towards a major adverse impact include:

- *A large number of windows or large area of open space are affected*
- *The loss of light is substantially outside the guidelines*
- *All the windows in a particular property are affected*

- *The affected indoor or outdoor spaces have a particularly strong requirement for skylight or sunlight, e.g., Living room in a dwelling or a children’s playground.* “

It is BPG3’s view that while this guidance provides a rough indication of how impacts should be classified it is not sufficiently detailed to address the requirements of current environmental impact guidance.

Notable shortcomings in the BRE’s guidance include:

- The thresholds at which it is reasonable for a practitioner to conclude that only a small/large number of windows are affected is not defined.
- The thresholds at which a loss of light is considered to be, either only marginally outside the guidelines, or substantially outside the guidelines, is not defined.
- The degree to which the assumed lighting requirements of subject rooms can be used to as either an upward or downward modifier in the categorisation of impact is not defined
- The classification scale provided is relatively coarse with only three categories proposed (Minor, Moderate, Major). A finer classification scale is needed to identify the impacts which fall in the margins between.

The primary upshot of this lack of precision is that it is very hard for a daylight consultant to reliably communicate the reasons why a particular classification has been attributed to the specific impacts which have been

identified within a daylight assessment. It is BPG3's view that in instances where the reasons a particular impact classification has been attributed are not clear the validity of the classification is undermined. Further to this it is BPG3's view that without some form of systematic categorisation framework it is very difficult for a daylight consultant to attribute reliable categorisations to the multitude of impacts which can register within an assessment.

In order to address this BPG3 has expanded and adapted the BRE's proposed classification scheme to align more closely with the best practice approaches detailed in Section 3.7 of the EPA guidance document '*Guidelines on the information to be contained in Environmental Impact Assessment Reports*' 2017.

The resulting impact classification framework is presented in Appendix E: Conventions used to Assess the Significance of Impacts.

Appendix G: Shadow Casting Imagery

The set of overshadowing diagrams which accompany this report are discretionary and are not an integral part of the recommended assessment procedure. They have been included simply to provide the reader with some context regarding the orientation of the site with respect to the sun.

Section 6.6 of the DoHPLG guideline document *‘Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities’ 2018*, provides the following guidance:

*“Planning authorities should have regard to **quantitative** performance approaches to daylight provision outlined in guides like the BRE guide ‘Site Layout Planning for Daylight and Sunlight’ (2nd Edition) or BS 8206-2:2008 – ‘Lighting for Buildings – Part 2: Code of Practice for Daylighting’ when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision.” **[emphasis added]***

Accepting that the assessment of shadow casting imagery does not qualify as a quantitative approach (it is qualitative and subjective) it follows that this approach can no longer be regarded as an acceptable method for assessing impact in Ireland.

Where shadow casting imagery would have been used in the past to assess the degree to which a new development could impact on sunlight levels available to neighbouring gardens and amenity spaces, it is clear that this assessment must now be carried out on a quantitative basis. This quantitative assessment has been carried out and is presented in Study C of this report.

Without prejudice to the foregoing, a set of shadow casting imagery has been generated and is presented on the following pages. This material is presented on a strictly discretionary basis and the reader is advised that the information conveyed in the imagery carries no weight in the assessment of overshadowing or indeed in the determination of impact acceptability. The imagery has been included simply to provide the reader with some context regarding the orientation of the site with respect to the sun.

Further to this the BRE guide recommends that if a space is used all year round, that the spring equinox is the best date for which to prepare shadow plots as it gives an average level of overshadowing. Shadow casting imagery for salient times on the 21st of March have been generated for this project. As shadow casting imagery is determined to be of limited utility in the

assessment of impact, the additional imagery for Winter and Summer has not been generated for this project⁸.

The BRE Guide provides the following guidance with respect to shadow plots:

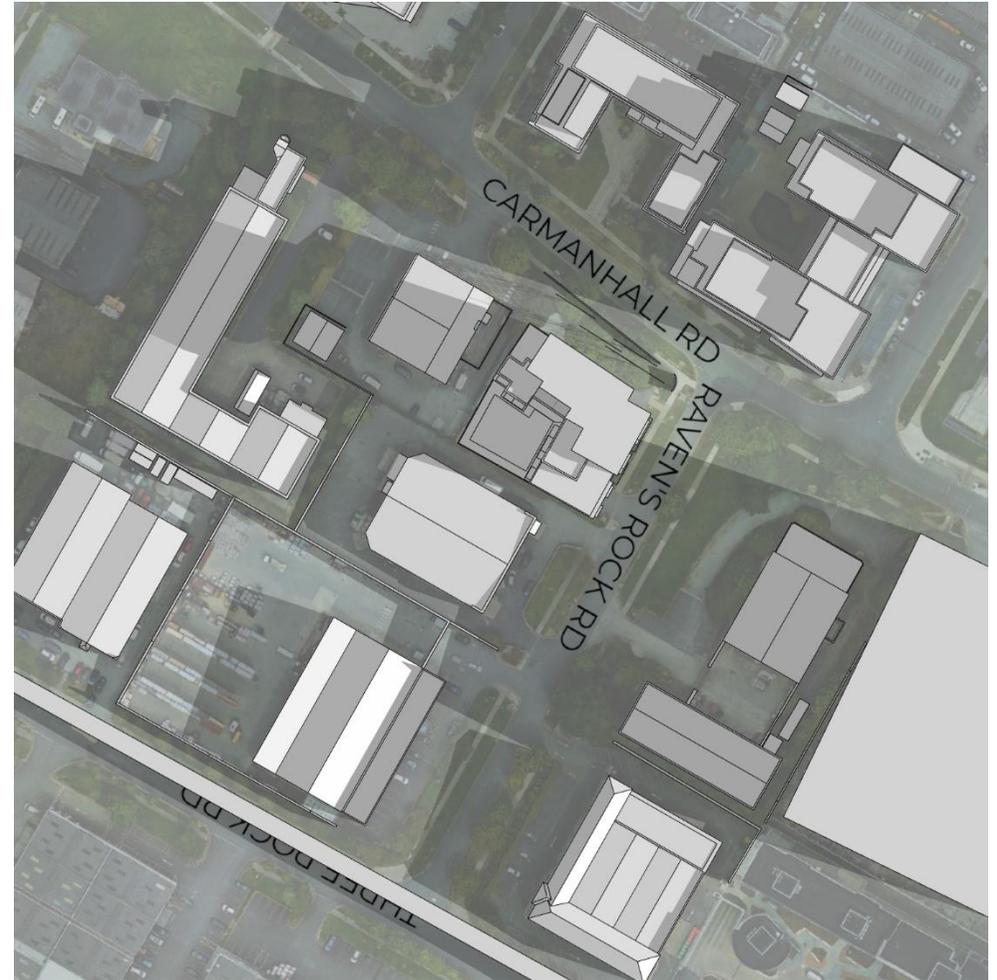
*“When there are existing buildings as well as the proposed one, ‘before’ and ‘after’ shadow plots showing the difference that the proposed building makes may be helpful. In interpreting the impact of such differences, **it must be borne in mind that nearly all structures will create areas of new shadow, and some degree of transient overshadowing of a space is to be expected.** “*
[emphasis added]

⁸ While Section 6.6 of the DoHPLG guideline document ‘Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities’ 2018 validates the omission of shadow casting imagery, in its entirety, from sunlight and

daylight assessment reports, it is also the case that the BRE guide recommends that Winter and Summer imagery need only be considered as an optional extra.

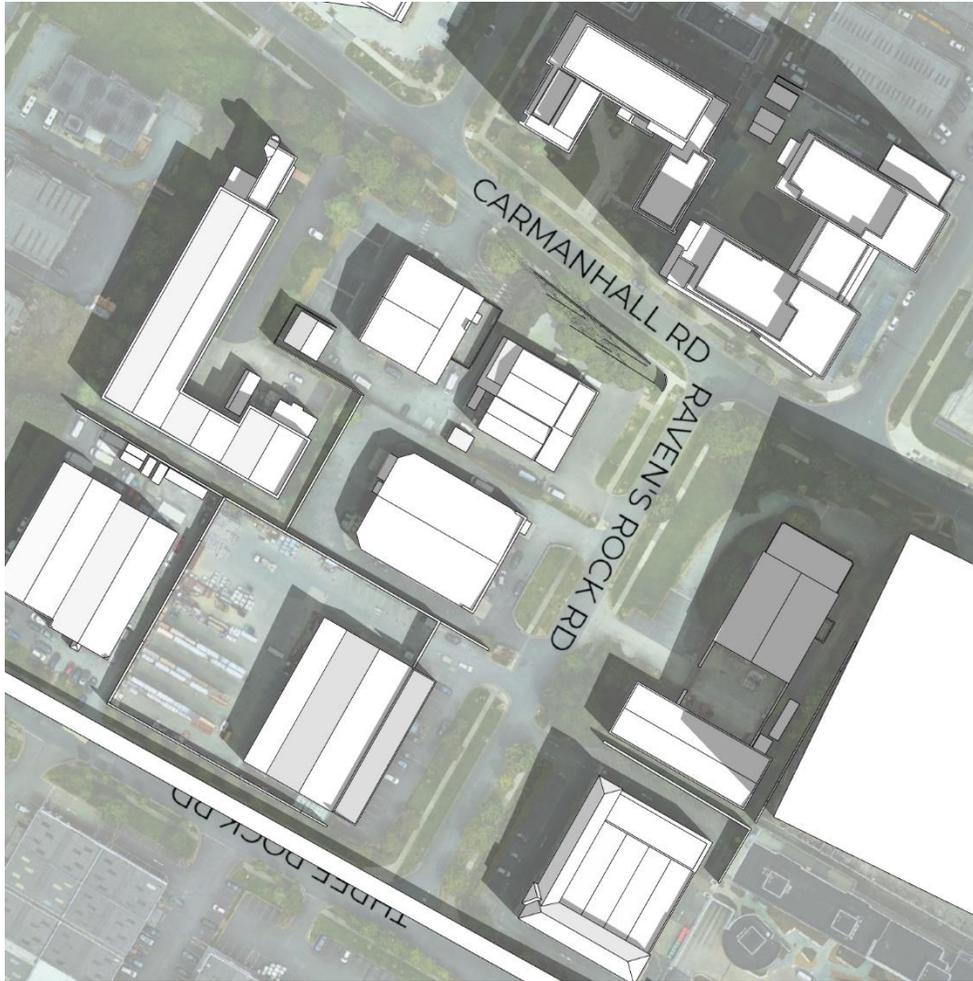


Shadows Cast at 8am (UTC+0) on the 21st March - Before Development Scenario

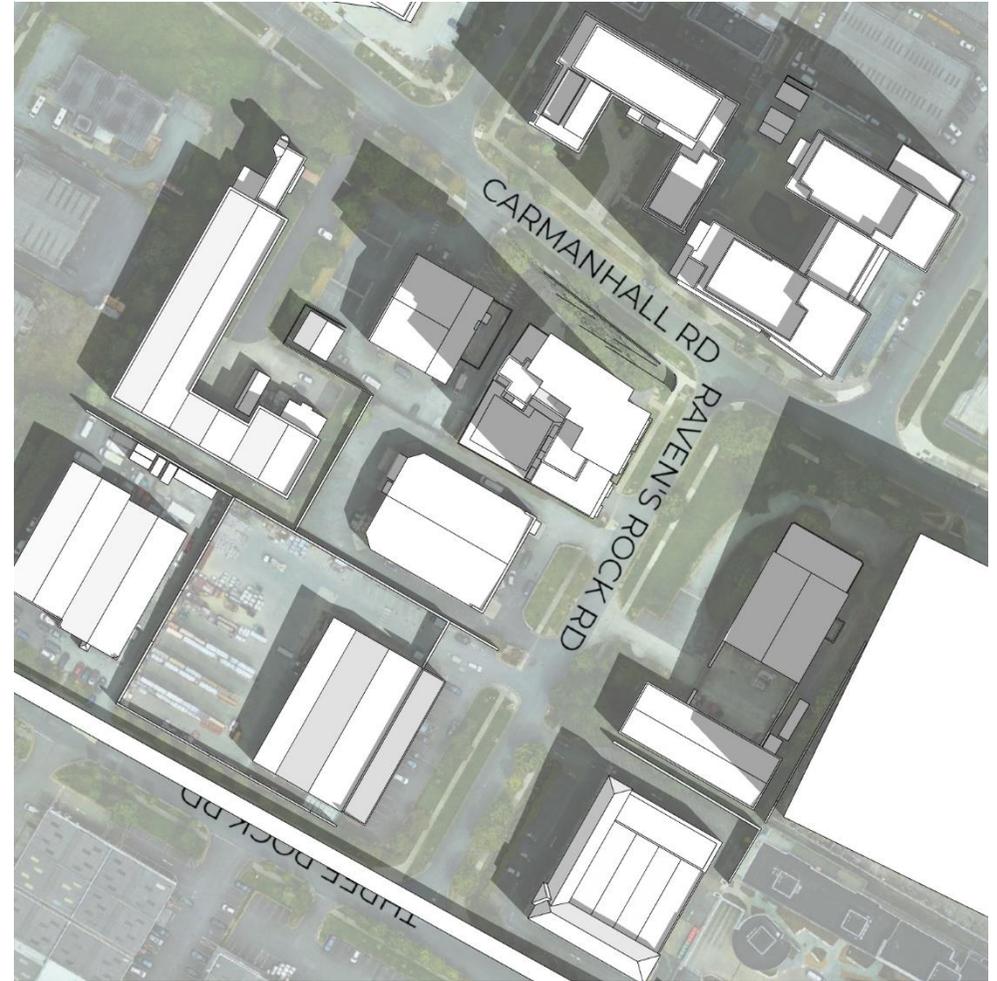


Shadows Cast at 8am (UTC+0) on the 21st March - After Development Scenario

Pursuant to Section 6.6 of the DoHPLG guideline document '*Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities*' 2018 the information conveyed in this imagery cannot be relied upon to adduce impacts.

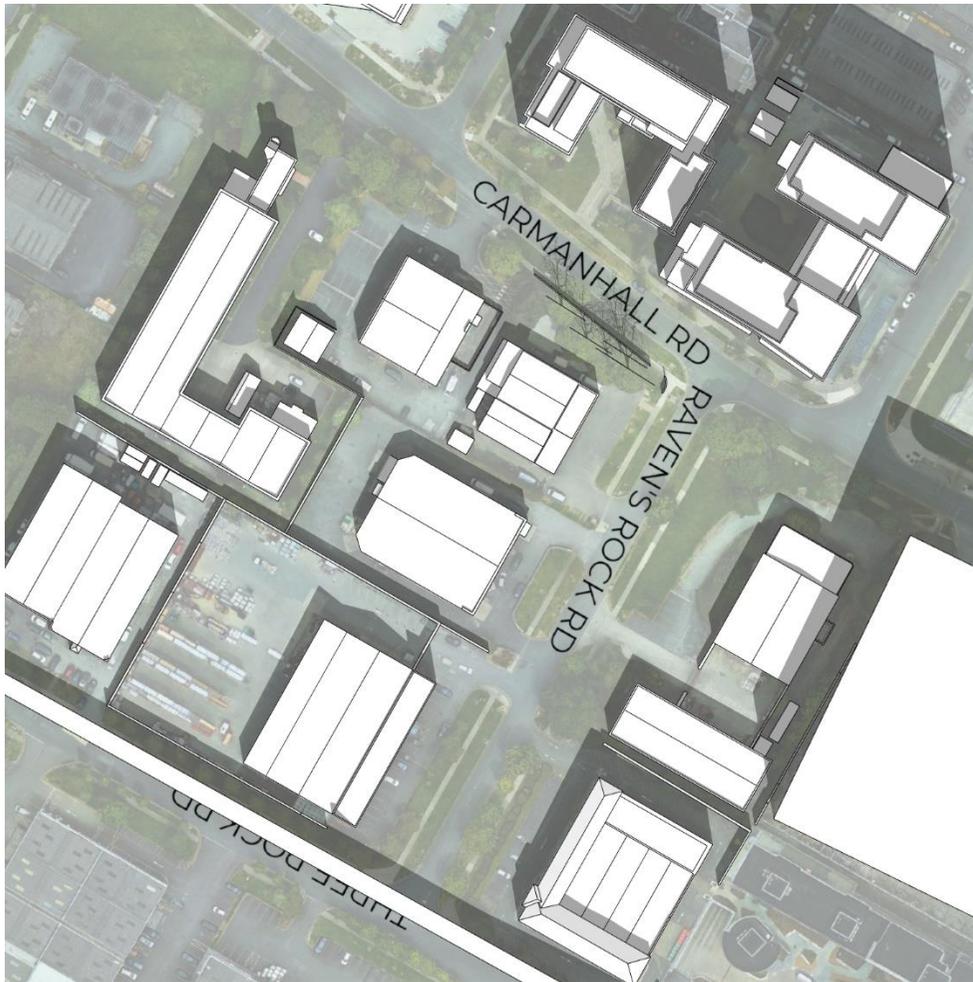


Shadows Cast at 10am (UTC+0) on the 21st March - Before Development Scenario



Shadows Cast at 10am (UTC+0) on the 21st March - After Development Scenario

Pursuant to Section 6.6 of the DoHPLG guideline document '*Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities*' 2018 the information conveyed in this imagery cannot be relied upon to adduce impacts.



Shadows Cast at 12pm (UTC+0) on the 21st March - Before Development Scenario



Shadows Cast at 12pm (UTC+0) on the 21st March - After Development Scenario

Pursuant to Section 6.6 of the DoHPLG guideline document '*Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities*' 2018 the information conveyed in this imagery cannot be relied upon to adduce impacts.



Shadows Cast at 2pm (UTC+0) on the 21st March - Before Development Scenario



Shadows Cast at 2pm (UTC+0) on the 21st March - After Development Scenario

Pursuant to Section 6.6 of the DoHPLG guideline document '*Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities*' 2018 the information conveyed in this imagery cannot be relied upon to adduce impacts.



Shadows Cast at 4pm (UTC+0) on the 21st March - Before Development Scenario



Shadows Cast at 4pm (UTC+0) on the 21st March - After Development Scenario

Pursuant to Section 6.6 of the DoHPLG guideline document '*Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities*' 2018 the information conveyed in this imagery cannot be relied upon to adduce impacts.



Shadows Cast at 6pm (UTC+0) on the 21st March - Before Development Scenario



Shadows Cast at 6pm (UTC+0) on the 21st March - After Development Scenario

Pursuant to Section 6.6 of the DoHPLG guideline document '*Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities*' 2018 the information conveyed in this imagery cannot be relied upon to adduce impacts.

Appendix H: Assumed Future Neighbouring Developments



ALL DIMENSIONS TO BE CHECKED ON SITE
 ALL DIMENSIONS TO BE SCALE UNLESS OTHERWISE STATED
 DRAWING IS THE PROPERTY OF THE CLIENT AND IS NOT TO BE REPRODUCED OR COPIED WITHOUT THE CLIENT'S PERMISSION



EAST ELEVATION SHOWING PROPOSED NIEIGHBOURING DEVELOPMENT
 1 : 200



NORTH ELEVATION SHOWING PROPOSED NIEIGHBOURING DEVELOPMENT
 1 : 200

REV	DATE	DESCRIPTION	CHK	APP

CLIENT: Ravensbrook Limited
 PROJECT: Ravens Rock Road SMD, IVM House, nos. 31 and 31a Ravens Rock Road, Sandymount Business Park, Dublin 18
 DRAWING: NEIGHBOURING ELEVATIONS

PROJECT NUMBER	DATE
SKETCH	02/01/21

SCALE	DESIGNED BY
1:200	AD/30

SYMBOL CODE	DESCRIPTION	REVISION

Henry J Lyons
 Architects & Surveyors
 1001-1003 1003
 1001-1003 1003
 1001-1003 1003

Appendix I: Skylight available to neighbouring future developments

Assessing the consequence which a proposed development could have on the development potential of adjacent lands is a valid line of inquiry but not one that is often pursued in Ireland. As this type of assessment is infrequently commissioned in Ireland a clear approach to testing has yet to be established.

Some guidance on the subject is provided within Section 2.3 of the BRE (Building Research Establishment) guide 'Site layout planning for daylight and sunlight - A guide to good practice' 2nd Edition however, the compatibility of this testing with the requirements of urban design is open to question. The test criteria recommended by the BRE is summarised as follows:

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

- (a) No new building, measured in a vertical section perpendicular to the boundary, from a point 1.6m above ground level, subtends an angle of more than 43 degrees to the horizontal*
- (b) Or, if (a) is not satisfied, then all points 1.6m above the boundary line are within 4m (measured along the boundary) or a point which has a VSC (looking towards the new building(s)) of 17% or more.*

Applying the 43-degree test criteria detailed in Section 2.3 of the BRE guide consistently across all three of the sites in this locality places unrealistic

restrictions on the development forms which could be pursued (in order to achieve conformity with the BRE's test criteria all volumes highlighted in red would need to be removed; see Figure 6).

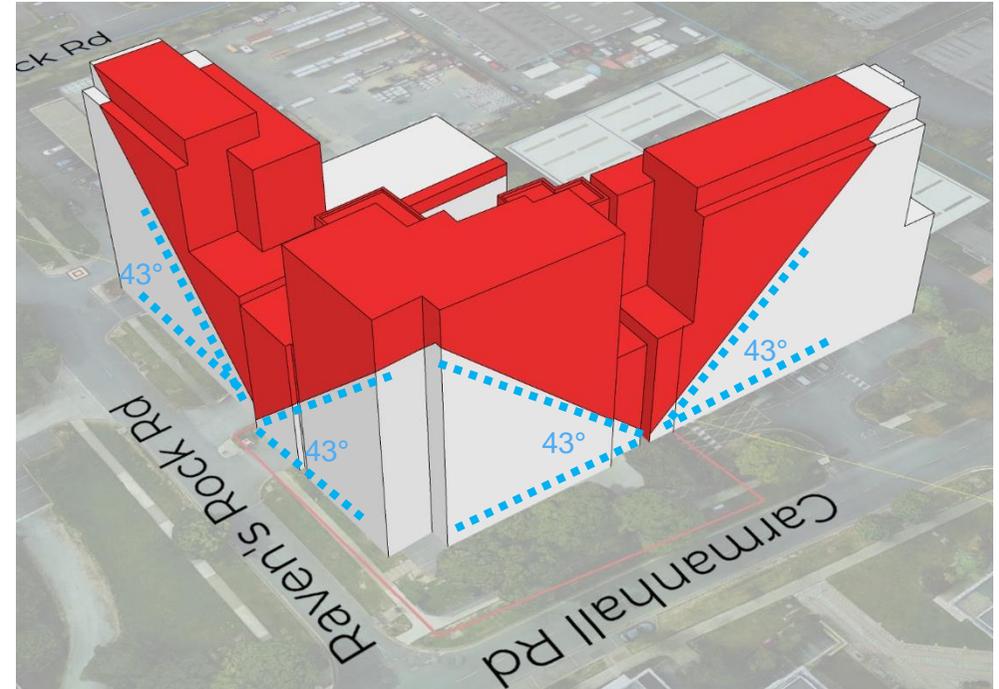


Figure 6 Volumes identified in red offend the BRE's 43-degree test criteria

Examining the results which the BRE's test criteria produce in this circumstance provides confirmation that the BRE's standard testing procedure is not well adapted to the case in hand. In particular it would seem to offer an undue level of protection to gable elevations (sitting on the common boundary) which are unlikely to contain windows.

In order to gain a better understanding of the implications neighbouring developments would have for access to natural light a more detailed assessment method is proposed. Recognising that this alternative assessment represents an extension of the BRE guidelines, it is BPG3's view that the results it produces are instructive for the case in hand.

BPG3 propose that the degree to which future developments would be able to secure adequate levels of natural light, can be investigated by testing VSC levels across all relevant elevations and comparing the results obtained to the recommendations provided in Section 2.1.6 of the BRE Guide; (see Table 6).

Section 2.1.6 of the BRE Guide describes the relationship between VSC levels and the adequacy of internal light levels in different situations, see Table 6. This guidance indicates that daylighting within an apartment with conventional window design will usually be adequate in circumstances where a VSC of at least 27% is available and that adequate daylight can still be assured at lower levels with responsive design.

The VSC levels which would be accessible on the main elevation of the assumed future developments, on neighbouring sites (with the development proposed under this application also in place) are presented on the following pages, see Figure 7, Figure 8, Figure 9.

Table 6 VSC Levels recommended in Section 2.1.6 of the BRE Guide

VSC Level	BRE Recommendation
Greater than or equal to 27%	Conventional window design will usually give reasonable results
Between 15% and 27%	Special measures (larger windows, changes to room layout) are usually needed to provide adequate daylight
Between 5% and 15%	It is very difficult to provide adequate daylight unless very large windows are used
Below 5%	It is often impossible to achieve reasonable daylight, even if the whole window wall is glazed

Figure 7 Skylight access (measured with reference to VSC) available to assumed future developments on neighbouring sites

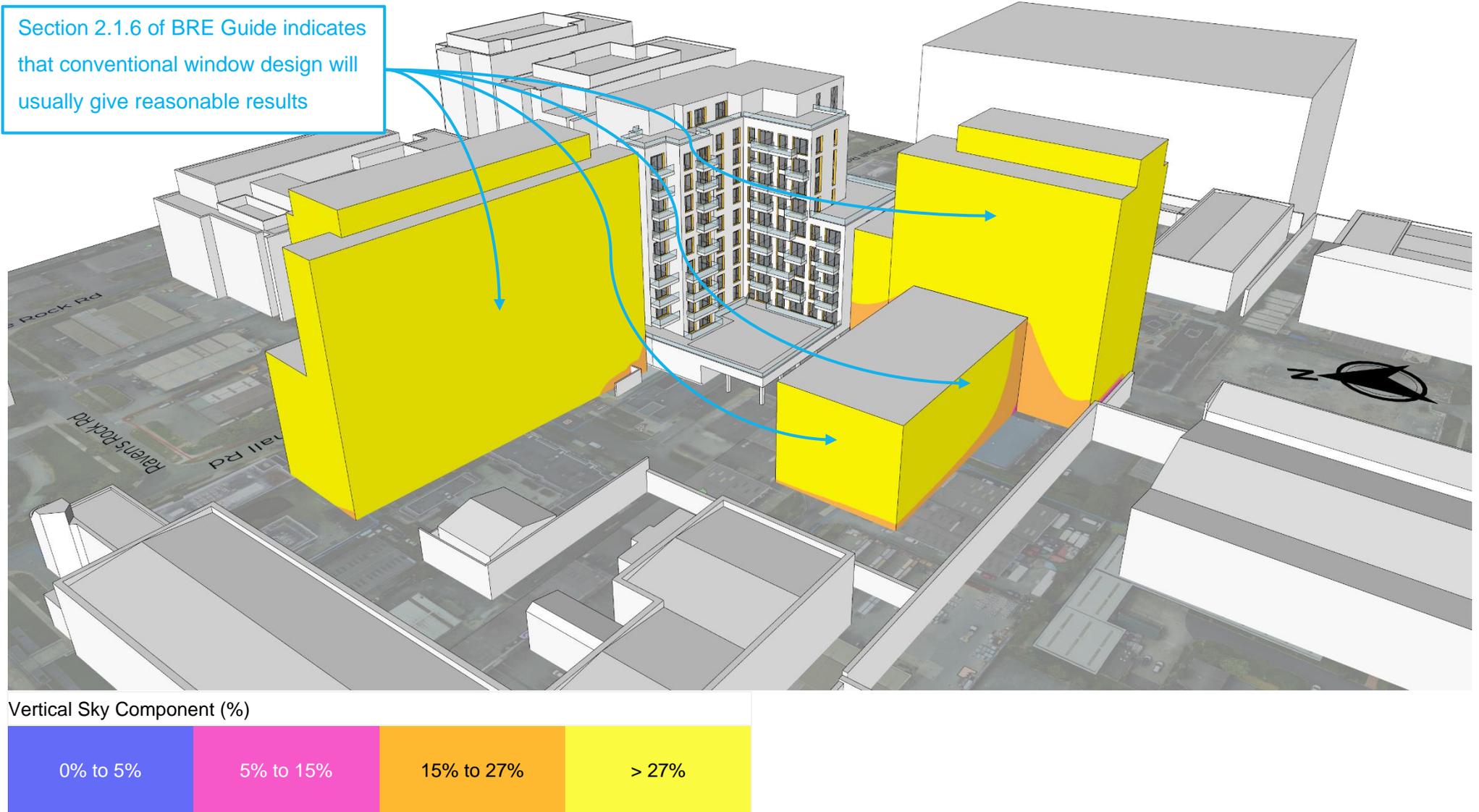


Figure 8 Skylight access (measured with reference to VSC) available to assumed future developments on neighbouring sites

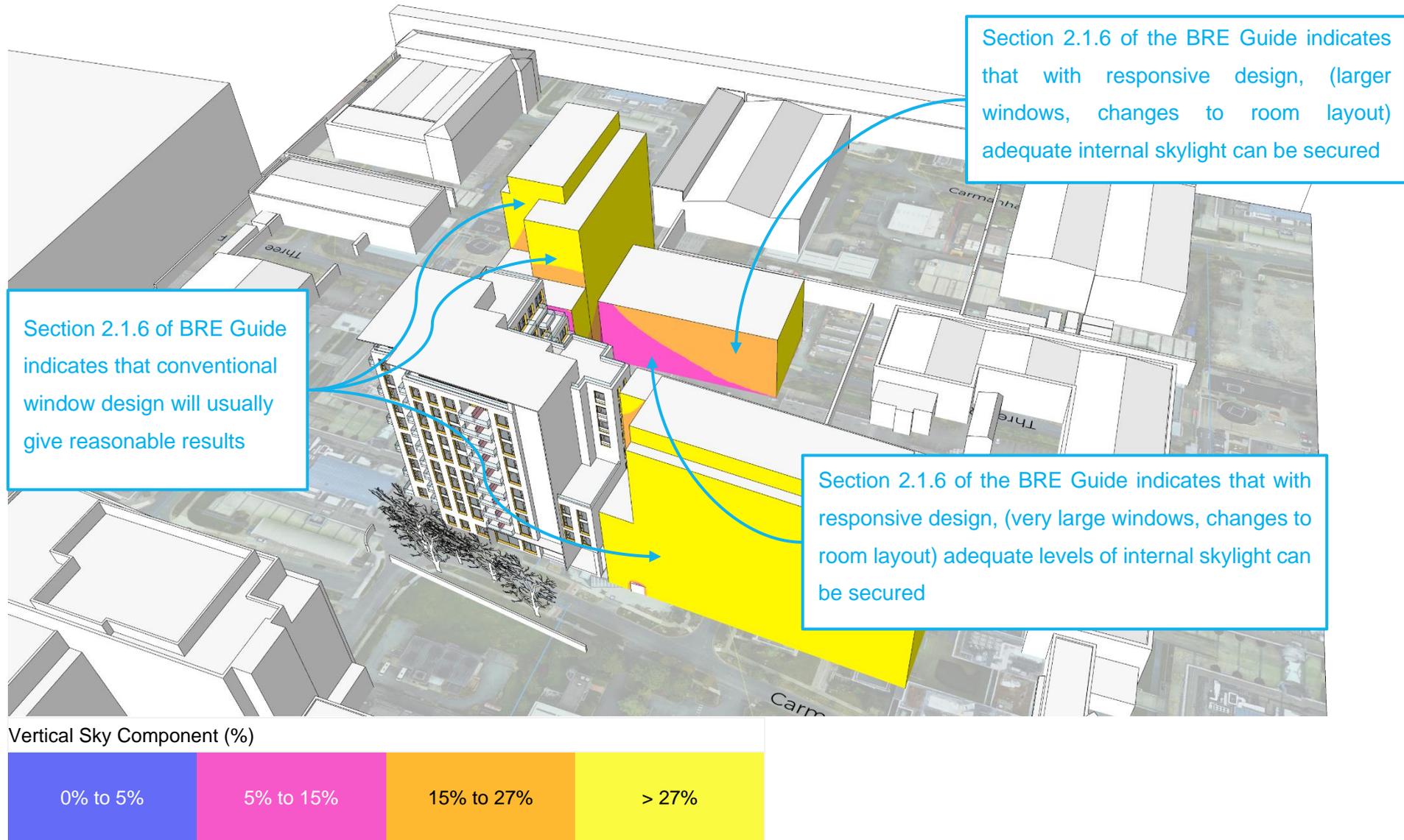


Figure 9 Skylight access (measured with reference to VSC) available to assumed future developments on neighbouring sites

Section 2.1.6 of BRE Guide indicates that conventional window design will usually give reasonable results



Vertical Sky Component (%)



Appendix J: Annual sunlight available to neighbouring future developments

According to the BRE guide a dwelling, or non -domestic building which has a particular requirement for sunlight, will appear reasonably sunlit provided:

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

The annual APSH levels which would be accessible on the main elevation of the assumed future developments, on neighbouring sites, (with the development proposed under this application also in place) are presented on the following pages, see Figure 10, Figure 11, Figure 12. The equivalent results for winter sunlight access are provided in Appendix K: Winter sunlight available to neighbouring future developments .

Figure 10 Annual sunlight access (measured with reference to APSH) available to assumed future developments on neighbouring sites

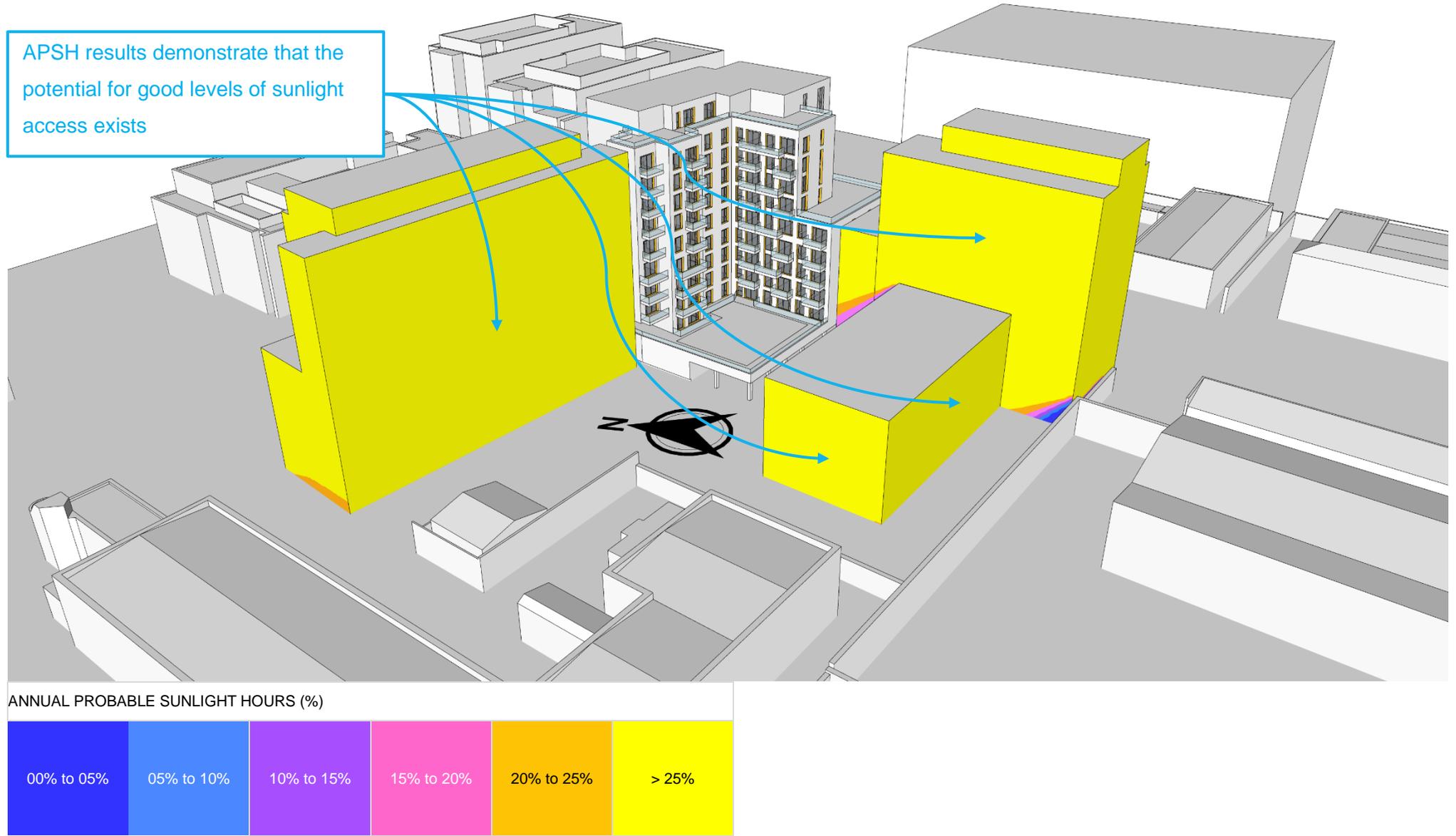


Figure 11 Annual sunlight access (measured with reference to APSH) available to assumed future developments on neighbouring sites

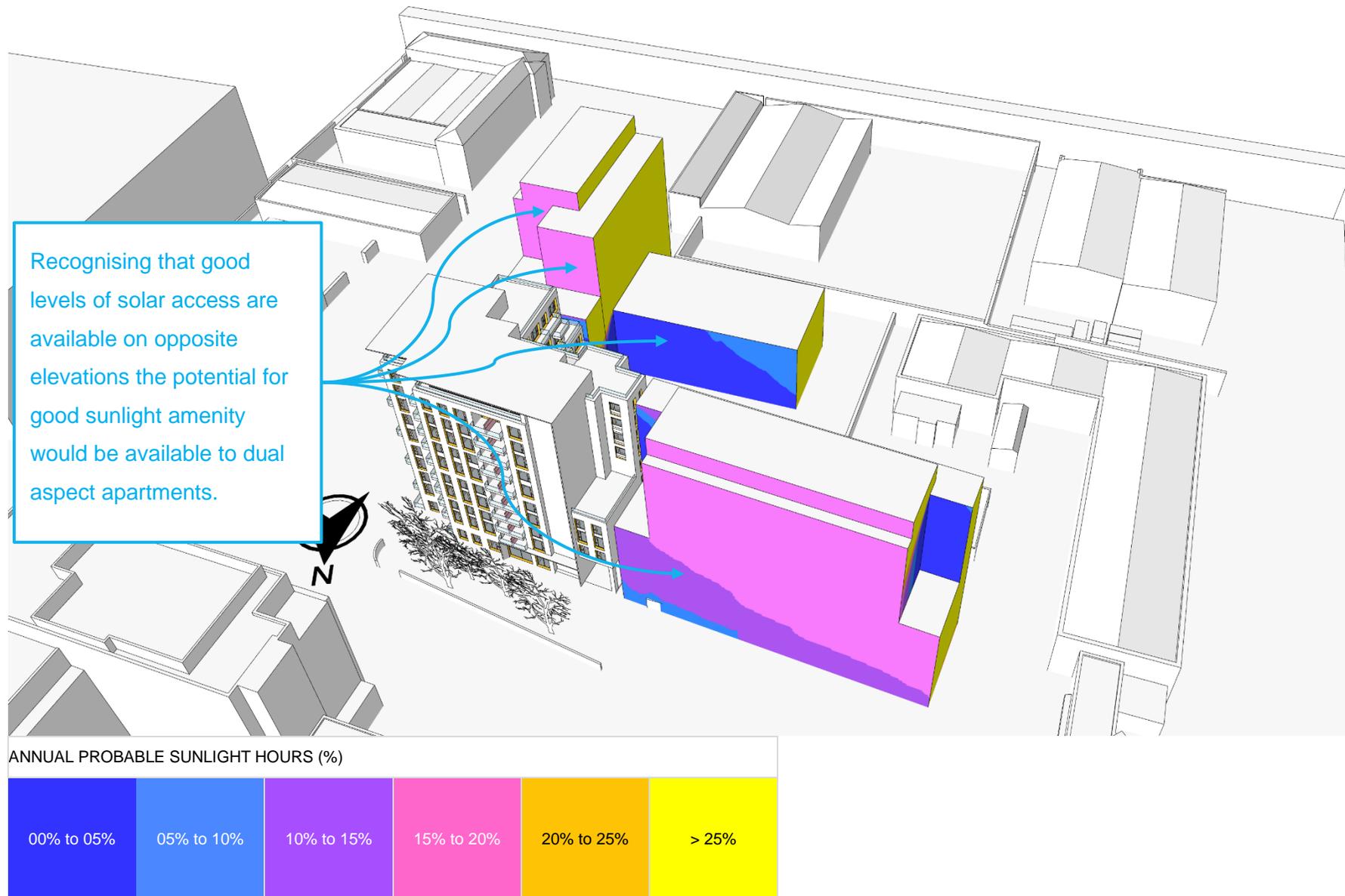


Figure 12 Annual sunlight access (measured with reference to APSH) available to assumed future developments on neighbouring sites



ANNUAL PROBABLE SUNLIGHT HOURS (%)



Appendix K: Winter sunlight available to neighbouring future developments

Figure 13 Winter sunlight access (measured with reference to APSH registering during winter months) available to assumed future developments on neighbouring sites

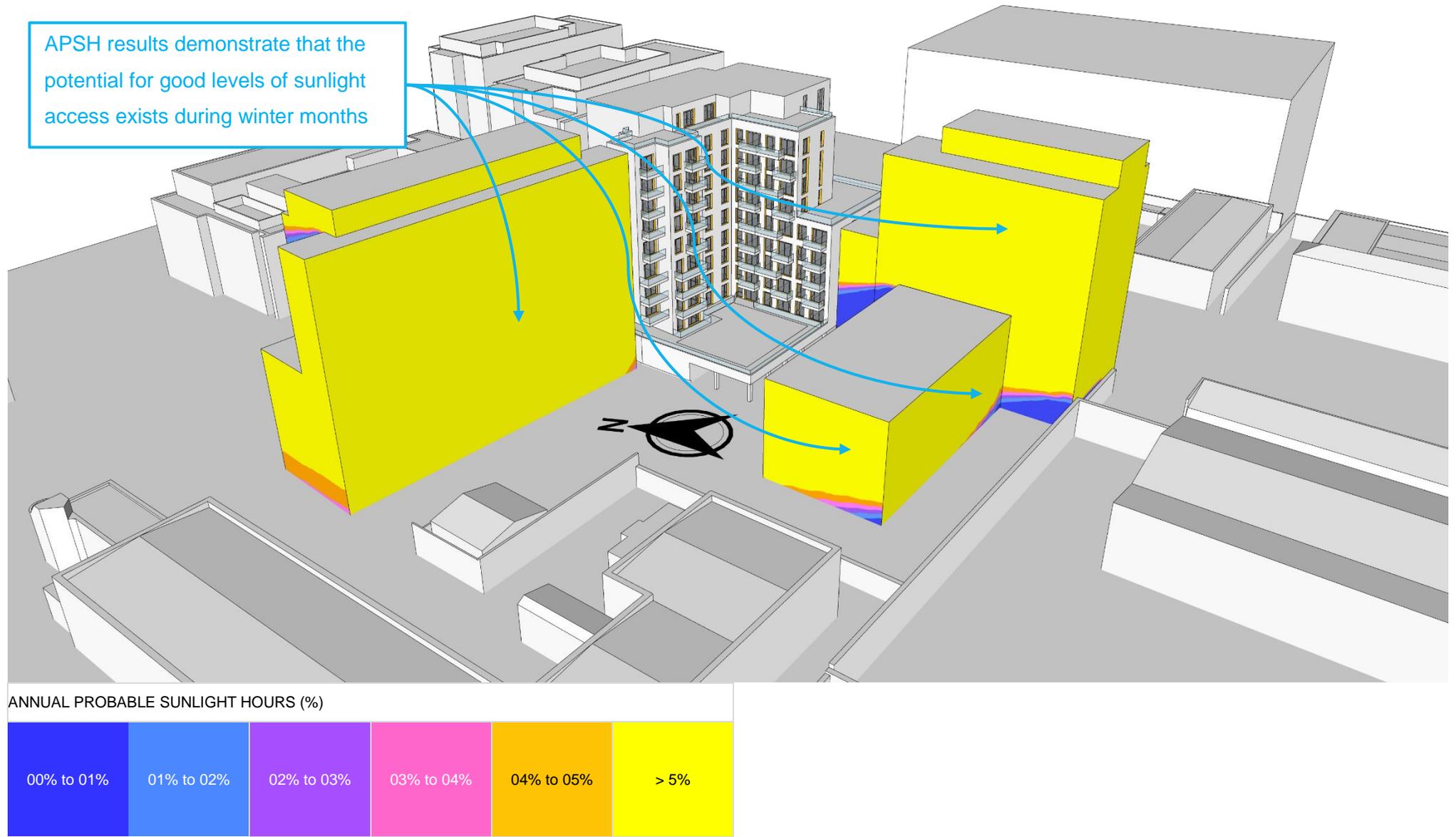
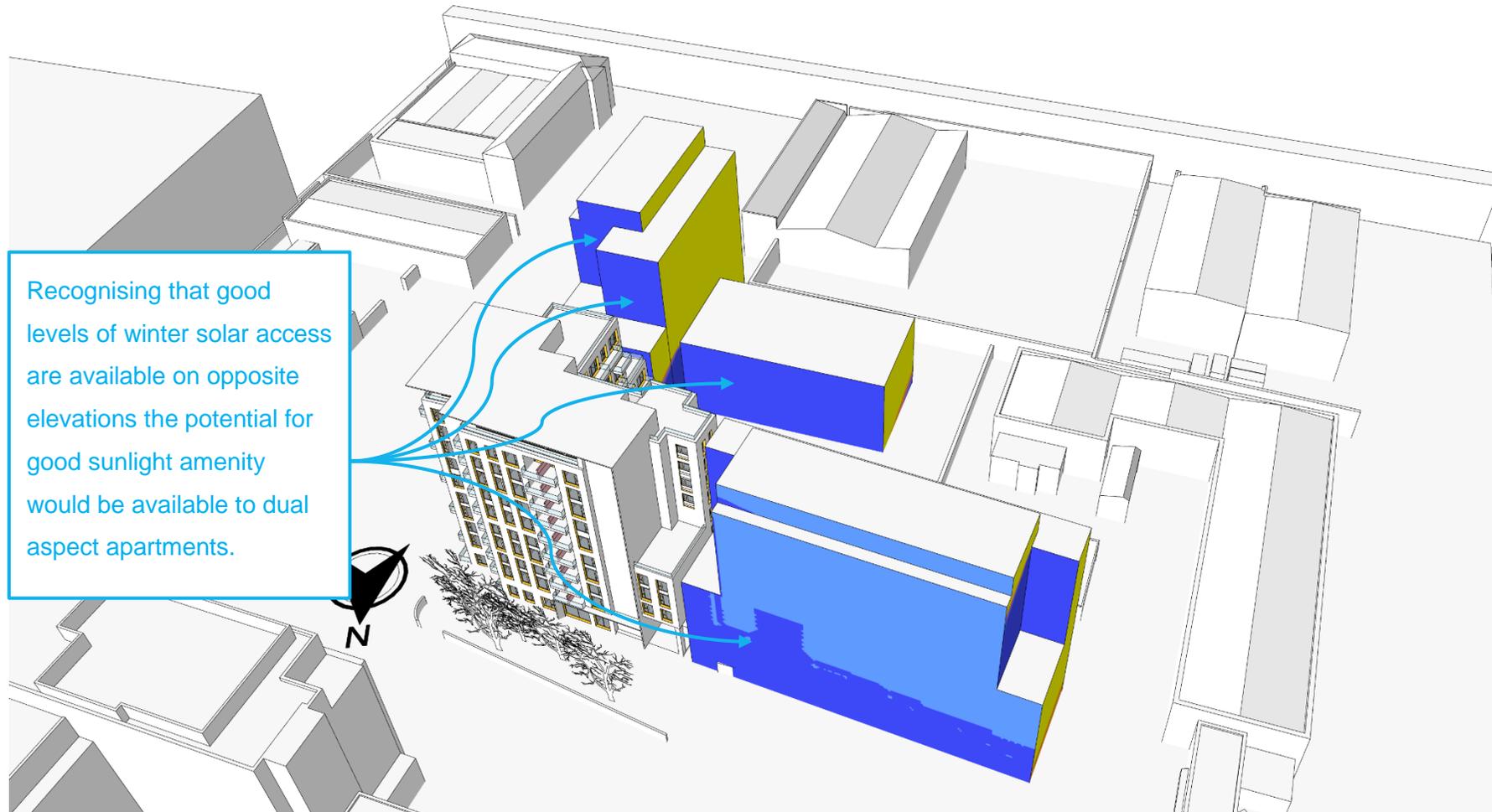


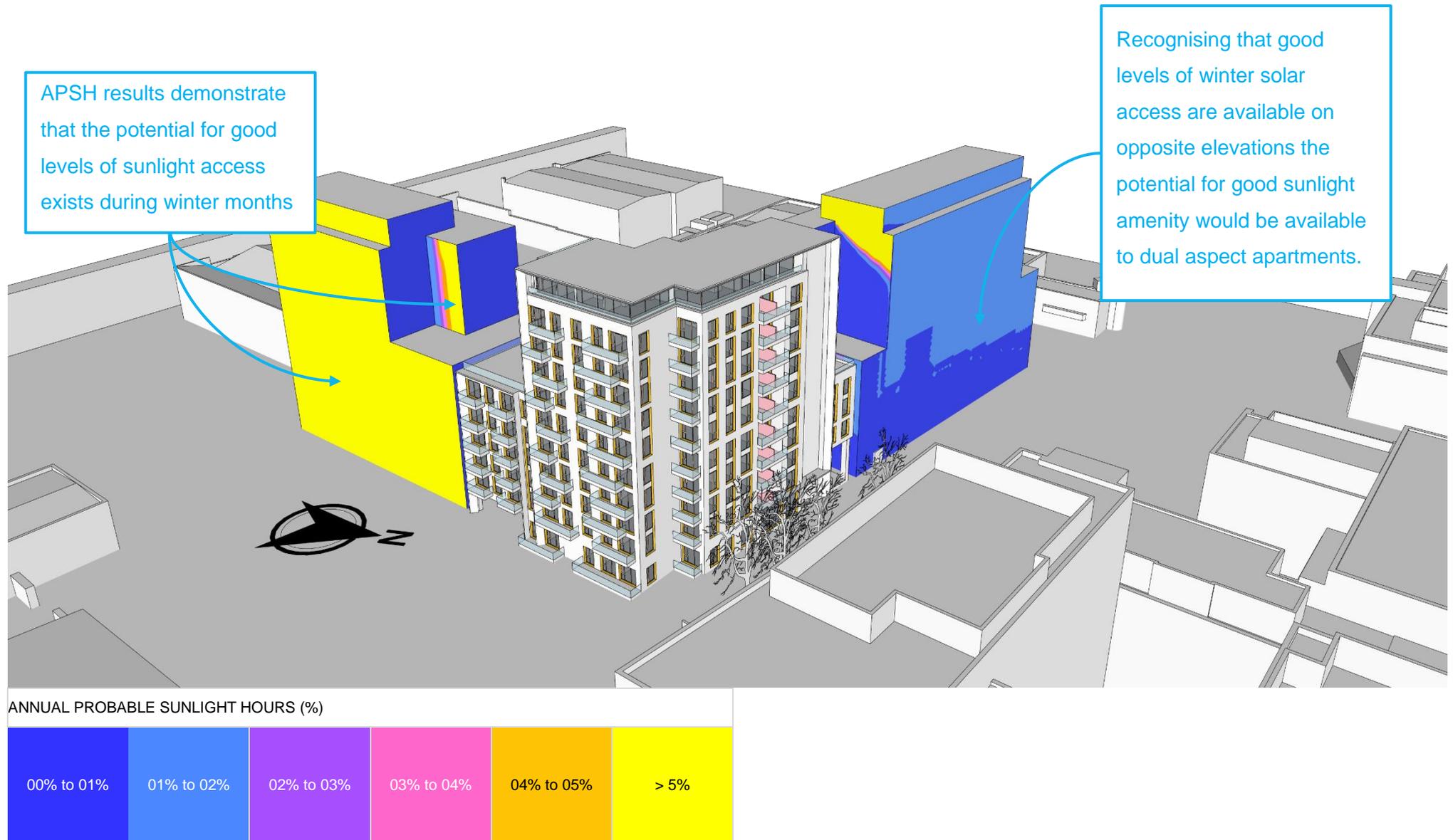
Figure 14 Winter sunlight access (measured with reference to APSH registering during winter months) available to assumed future developments on neighbouring sites



ANNUAL PROBABLE SUNLIGHT HOURS (%)



Figure 15 Winter sunlight access (measured with reference to APSH registering during winter months) available to assumed future developments on neighbouring sites



Appendix L: Solar access available to neighbouring future developments

This study relates to the assessment of sunlight amenity within the recreation spaces which are assumed to serve future developments on neighbouring sites.

Assessment Approach

The BRE propose that a garden or amenity area will appear adequately sunlit throughout the year if at least half of it can receive at least two hours of sunlight on the 21st of March.

In order to assess a particular amenity space an analysis grid is specified across its area. At each point on this grid the cumulative number of sunlight hours are calculated for the course of a specified day (the 21st of March in this case). The percentage of the analysed area which is capable of receiving more than 2 hours of sunlight over the course of the test day is then obtained.

Assessment Points

A total of four outdoor recreation spaces have been considered within this study, see Figure 16. The spaces selected for assessment relate to one area of public open space (Area 1) and three areas of communal open space located at podium and roof levels within the future developments assumed for neighbouring sites (Areas 2, 3, &4).

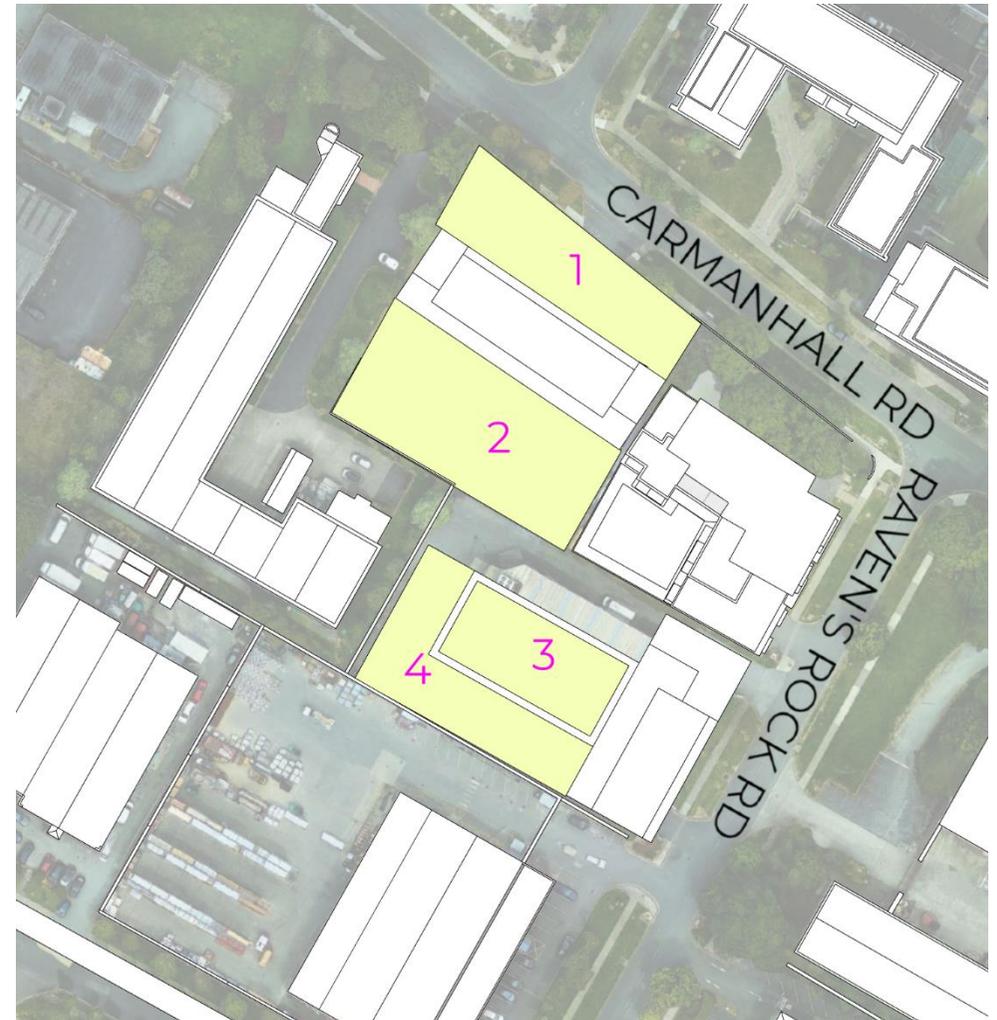


Figure 16 Outdoor areas assessed

Results

This study has assessed the levels of sunlight amenity that would be available to a number of outdoor recreation spaces which are assumed to serve future developments on neighbouring sites. The results obtained in this study indicate that the recommendations of the BRE guide would be satisfied in the majority of cases, see Table 7 and Figure 17.

In the singular instances where it has not been possible to demonstrate full compliance with BRE guidelines on the recommended test day (Area 1), it has been possible to show that increased levels of sunlight access would be available during summer months, see Figure 18, Figure 19, Figure 20.

An additional study has been carried out to investigate the degree to which the additional height which is being proposed on these sites (heights over and above those suggested in the urban framework plan) contribute to the overshadowing which has been identified for the assumed public outdoor amenity area to the North (Area 1). In this study the outdoor areas (Area 1 – 4) are tested again under a hypothetical development scenario where all buildings in this location are restricted to a height of five storeys, see Figure 21. The results of this supplementary study indicate that the levels of overshadowing associated with the additional height scenario (see Appendix H: Assumed Future Neighbouring Developments) and the capped height scenario (see Figure 21) are broadly comparable; see Figure 22 and Figure 17. In reliance on this finding, it is possible to conclude that, to a large

extent, the additional height which is being proposed on these sites is not causing the departures identified.

Table 7 Sunlight access predicted for outdoor recreation spaces proposed within the development. (Standard BRE testing highlighted in blue; Professional interpretation of test results highlighted in orange)

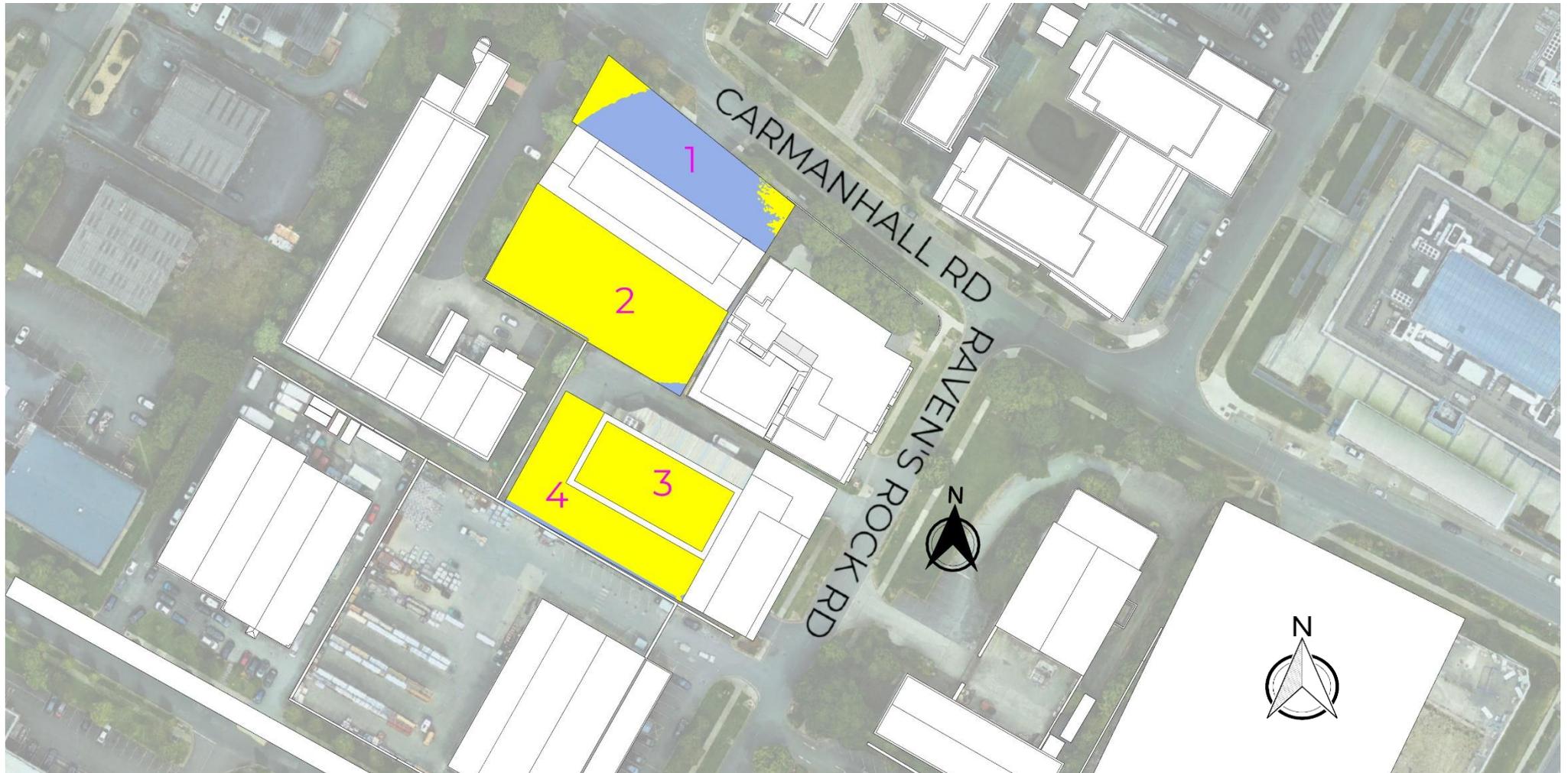
Space ID	Space Type (See Note C)	Approximate Area (m2)	% Area capable of receiving at least 2hrs of sunshine on the 21st of March [%]	Area capable of receiving at least 2hrs of sunshine on the 21st of March [m2]	More than 50% of garden area can receive at least 2hrs of sunlight on the 21st of March?	Conformity with BRE Guidelines Demonstrated?	Professional interpretation of result
1		868	21%	180	No	No	<i>Sunlight availability restricted to summer months; see Note B</i>
2		1335	98%	1308	Yes	Yes	<i>Reasonable levels of year-round sunlight anticipated; see Note A</i>
3		554	100%	554	Yes	Yes	<i>Reasonable levels of year-round sunlight anticipated; see Note A</i>
4		742	95%	706	Yes	Yes	<i>Reasonable levels of year-round sunlight anticipated; see Note A</i>
	P	3499	79%	2748			

Note A As the proportion of this area which can receive 2hrs of direct sunlight on the 21st of March exceeds the minimum level recommended by the BRE it is safe to assume that reasonable levels of year-round sunlight amenity would be available.

Note B As the proportion of this area which can receive 2hrs of direct sunlight on the 21st of March falls short of the minimum level recommended by the BRE sunlight provision is likely to be limited to summer months; see Figure 18, Figure 19& Figure 20 for supporting analysis.

Note C C = Communal Open Space P = Public Open Space

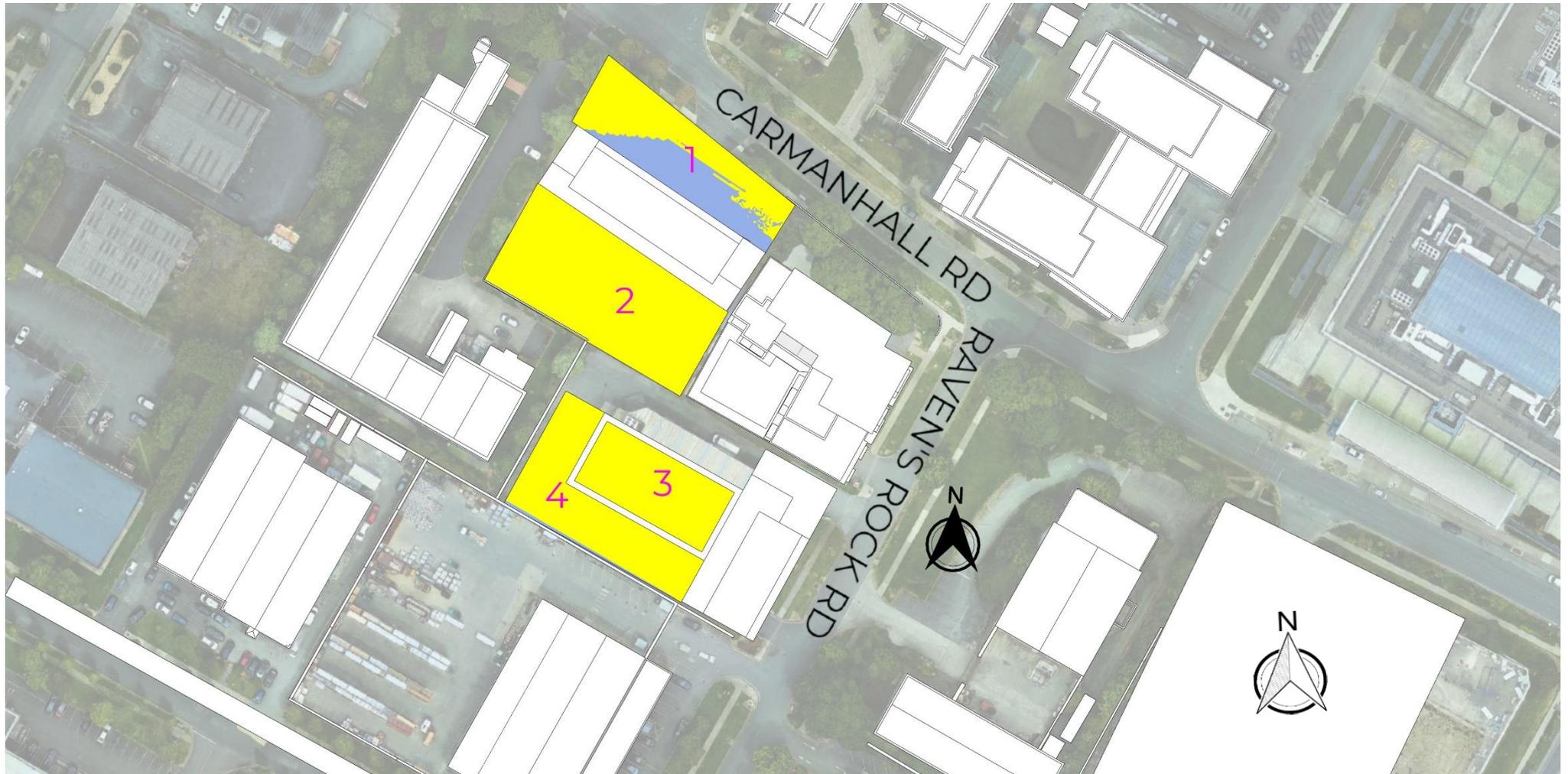
Figure 17 Sunlight access levels predicted for outdoor recreation space on the recommended test day (21st of March)



TOTAL NO. SUNLIGHT HOURS ON THE 21ST OF MARCH (HRS)



Figure 18 Sunlight access levels predicted for outdoor recreation space on the 21st of April



TOTAL NO. SUNLIGHT HOURS ON THE 21ST OF APRIL (HRS)



Figure 19 Sunlight access levels predicted for outdoor recreation space on the 21st of May



TOTAL NO. SUNLIGHT HOURS ON THE 21ST OF MAY (HRS)



Figure 20 Sunlight access levels predicted for outdoor recreation space on the 21st of June



TOTAL NO. SUNLIGHT HOURS ON THE 21ST OF JUNE (HRS)



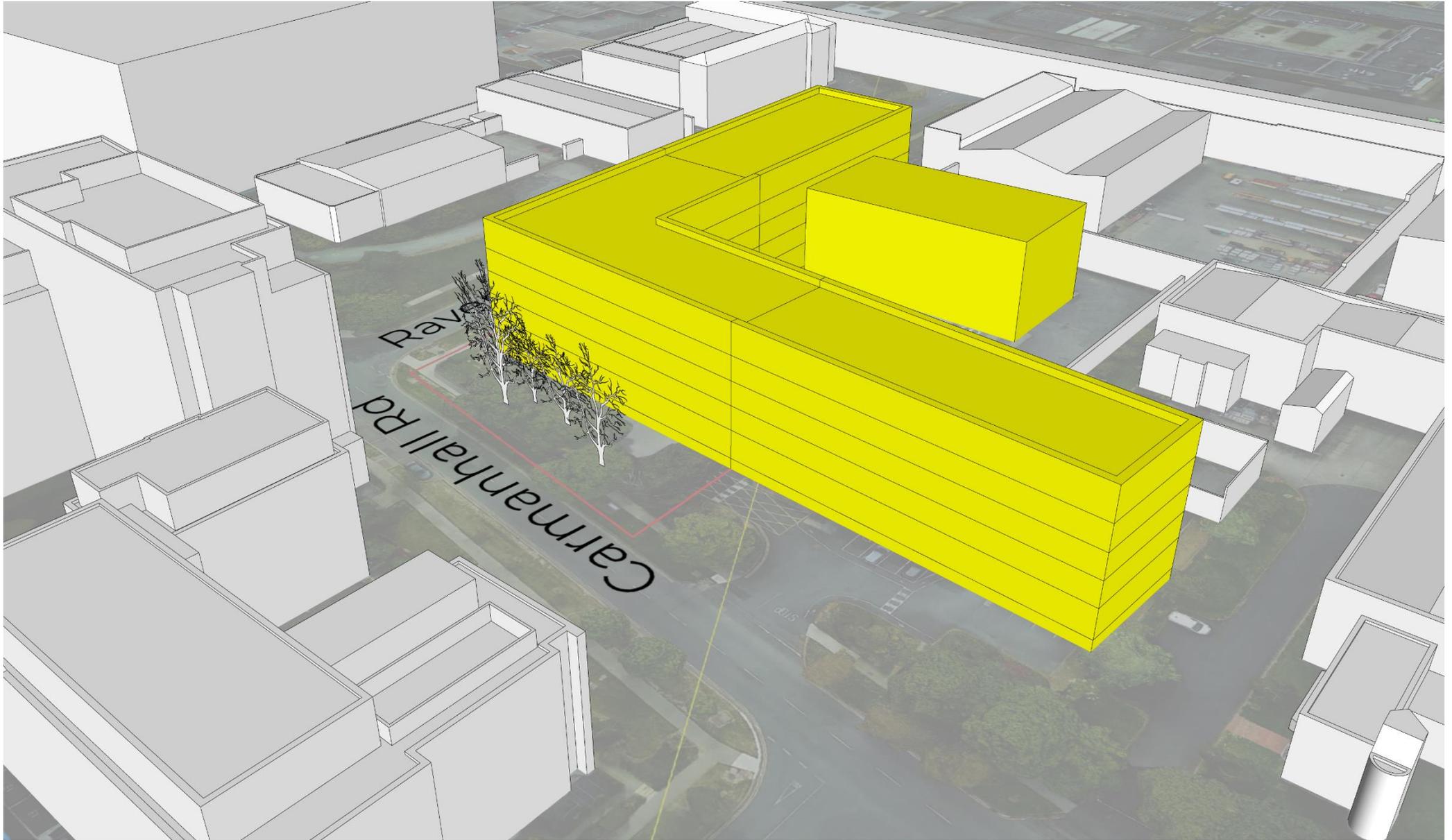
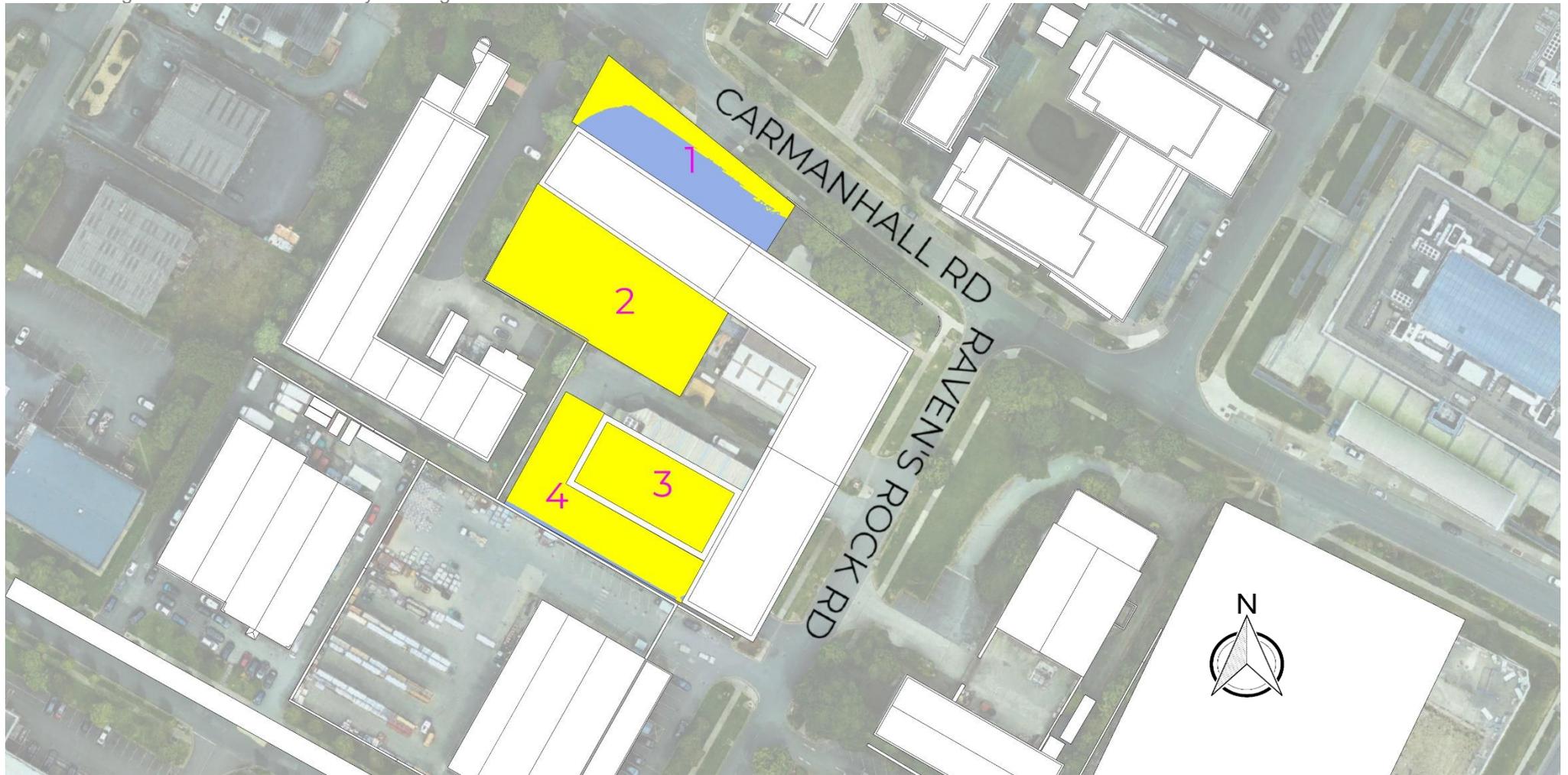


Figure 21 Hypothetical alternative development scenario (all heights capped at five storeys)

Figure 22 Sunlight access levels predicted for outdoor recreation space on the recommended test day (21st of March) under the hypothetical alternate scenario where all future buildings do not exceed five storeys in height.



TOTAL NO. SUNLIGHT HOURS ON THE 21ST OF MARCH (HRS)



Appendix M: About the Author

Rory Walsh BEng MEngSc MScSP PhD MIPI is a building performance engineer with key competencies in energy, comfort, and daylight modelling. Specialising in the assessment of daylight adequacy in a planning and development context Rory has had cause to write and review many daylight reports over the past ten years. Rory acts as principal consultant with BPG3.

Education & Experience:

- Bachelor's degree in mechanical engineering, awarded by NUIG
- Master's in Engineering Science awarded for research on the subject of thermal mass in non-domestic buildings with the Energy Research Group, UCD
- Doctorate awarded for research on the subject of natural ventilation in non-domestic buildings with TrinityHaus, Trinity College Dublin.
- Master's in Spatial Planning, awarded by TU Dublin.
- 10 years practice as a daylight consultant working with Aurea Consult and BPG3.