

35-39 FRIAR STREET READING

Daylight and Sunlight Report

7 JUNE 2022

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VERSION HISTORY

Version	Date	Details
1.0	08/02/2022	First issue
2.0	12/05/2022	Second issue
3.0	07/06/2022	Third issue

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1. Introduction

- 1.1. Delva Patman Redler LLP (“we”) have been engaged by the Applicant to assess daylight and sunlight for a planning application for proposed development at 35-39 Friar Street, Reading (“the Site”). We have been instructed to assess the potential effects on neighbouring properties and available levels in new dwellings within the proposed development.
- 1.2. Our daylight and sunlight study has been carried out using the assessment methodology recommended in the Building Research Establishment (BRE) Report 209, ‘*Site Layout Planning for Daylight and Sunlight: A guide to good practice*’ (second edition, 2011) (“the BRE guide”) and the Professional Guidance Note, ‘*Daylighting and sunlighting*’ (1st edition, 2012), published by the Royal Institution of Chartered Surveyors.
- 1.3. The Site is located within Reading Borough Council. The Site is shown outlined in red in the aerial photograph in Figure 1 below and on the location plan in Appendix 2.



Figure 1 - Aerial photo of the Site and neighbouring buildings (© Google)

- 1.4. The proposed development is illustrated in spot-height drawings in Appendix 2, and will be a proposed mixed use development comprising 103 residential units and 1,752 sqm floorspace of Class E (retail / food and drink and co-working) plus landscaping and other works.
- 1.5. This report is accompanied by Appendices explaining the BRE assessment methodology and containing drawings and tabulated results, as listed on the Contents page.

2. Planning policy and guidance

National Planning Policy and Guidance

National Planning Policy Framework (July 2021)

- 2.1. The National Planning Policy Framework (NPPF) sets out the Government's planning policies and how these should be applied. It provides a framework within which locally prepared plans for housing and other development can be produced. It places an emphasis on sustainable development and delivery of housing.
- 2.2. Chapter 11 of the NPPF, entitled "*Making effective use of land*", promotes the effective use of land in meeting the need for homes and other uses. It gives examples such as developing under-utilised land and buildings, especially if this would help to meet identified needs for housing where land supply is constrained and available sites could be used more effectively, and upward extensions to create new homes, where they would be consistent with the prevailing height and form of neighbouring properties and the overall street scene.
- 2.3. In particular, paragraph 125 of the NPPF states:

Area-based character assessments, design guides and codes and masterplans can be used to help ensure that land is used efficiently while also creating beautiful and sustainable places. Where there is an existing or anticipated shortage of land for meeting identified housing needs, it is especially important that planning policies and decisions avoid homes being built at low densities, and ensure that developments make optimal use of the potential of each site. In these circumstances:

c) local planning authorities should refuse applications which they consider fail to make efficient use of land, taking into account the policies in this Framework. In this context, 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).

BRE Report 209, 'Site Layout Planning for Daylight and Sunlight: A guide to good practice' (2011)

- 2.4. The leading publication providing national guidance on the provision of daylight and sunlight to new development, and the impacts of development on daylight and sunlight to neighbouring buildings and open spaces, is BRE Report 209, '*Site Layout Planning for Daylight and Sunlight: A guide to good practice*' (second edition, 2011). It is referred to in the development plan documents or supplementary planning documents of most planning authorities.
- 2.5. The BRE guide states:

(Its) main aim is ... to help to ensure good conditions in the local environment, considered broadly, with enough sunlight and daylight on or between buildings for good interior and exterior conditions.

The guide is intended for building designers and their clients, consultants and planning officials. The advice given is not mandatory and the report should not be seen as a part 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 the many factors in site layout design.

In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings... The calculation methods ... are entirely flexible in this respect.

British Standard, BS EN 17037:2019, 'Daylight in buildings'

- 2.6. British Standard, BS EN 17037:2019, 'Daylight in buildings' provides a standard and methodology by which to assess daylight and sunlight in new buildings. It does not deal with sunlight to open spaces or the effects of development on daylight and sunlight to existing neighbouring buildings.

Local planning policy**Reading Borough Local Plan:**

- 2.7. The Local Plan (adopted November 2019) contains the following policies that are relevant to daylight and sunlight.
- 2.8. Policy CC8 Safeguarding Amenity states:

"Development will not cause a detrimental impact on the living environment of existing residential properties or unacceptable living condition for new residential properties in terms of: Access to sunlight and daylight....".

3. Acceptability of daylight/sunlight levels and impacts

- 3.1. The assessment of impact on daylight and sunlight amenity is a two-part process¹: first, as a matter of calculation, whether there would be a material deterioration in conditions by reference to the BRE guidelines; and second, as a matter of judgment, whether that deterioration would be acceptable in the circumstances.
- 3.2. The first stage can be addressed by applying the BRE assessment methodology and numerical guidelines. The second stage brings into play much wider considerations, such as:
- i) Whether the neighbouring building stands unusually close to the site boundary, including the highway, taking more than its fair share of light, such that a greater reduction in light may be unavoidable if one site is not to be prejudiced by how another has been developed. (A 'mirror-image' study can be informative in such cases.)
 - ii) Whether windows in neighbouring buildings are self-obstructed by overhanging or inset balconies or other projections such as to make relatively larger reductions unavoidable even if there is a modest new obstruction opposite - in effect themselves taking away more than their fair share of light. (A 'without balconies' study can be informative in such cases.)
 - iii) In historic city centres or areas characterised by modern tall buildings, high density and close proximity, a higher degree of obstruction may be unavoidable if new buildings are to match the height and proportion of existing buildings.
 - iv) In areas that are designated by planning authorities for substantial growth or providing opportunities for change and sustainable regeneration, the sort of change that would be brought about by the introduction of taller, denser development is to be expected, including reductions in daylight and sunlight levels, closer proximity, loss of outlook, etc.
- 3.3. Where a higher degree of obstruction may be unavoidable it is appropriate to consider the reasonableness of the retained levels of daylight and sunlight with the proposed development in place.

¹ Rainbird, R (on the application of) v The Council of the London Borough of Tower Hamlets [2018]

4. Assessment methodology and numerical guidelines

- 4.1. The technical assessments that underpin this daylight and sunlight study have been carried out in accordance with the assessment methodology recommended in the BRE guide.
- 4.2. The principal assessments and numerical criteria are summarised below. A fuller explanation of the assessment methodology is given at Appendix 1 of this report.
- 4.3. British Standard, BS EN 17037:2019, '*Daylight in buildings*' provides an alternative method for assessing daylight and sunlight in new buildings; however, it does not cover impacts on existing neighbouring buildings or sunlight to open spaces. The BRE guide does and is the leading publication providing national guidance and is referred to in development plan documents or supplementary planning documents of most planning authorities. We have therefore followed the methodologies in the BRE guide.

New development

Daylight to new dwellings

- 4.4. The principal BRE test for daylight provision to rooms in new buildings is the average daylight factor (**ADF**), which measures the overall amount of daylight in a space.
- 4.5. The calculation takes account of the amount of visible sky, net glazed area of windows/doors, diffuse visible light transmittance of the glazing, maintenance factor for the effects of dirt, total area of the room surfaces and their average reflectance.
- 4.6. The minimum recommended ADF in housing is 1% for bedrooms, 1.5% for living rooms and 2% for kitchens. Bathrooms, stairwells and other areas without a special requirement for daylight need not be assessed.
- 4.7. Strictly speaking, in multi-purpose rooms, such as open-plan living/kitchen/dining rooms (LKDs), the target for kitchens should apply. However, planning authorities frequently accept the living room target (1.5% ADF) for LKDs in modern housing development. That view is supported by the author of the BRE guide, Dr Paul Littlefair, who explains it thus²:

Where a room has a shared use, the British Standard states that the higher minimum value should apply. However, local authorities frequently accept the living room standard for a shared kitchen/living room, as a small kitchen would not be considered as a habitable room. This is a practical approach, as it is seldom in the final resident's interest to have a closed off, small kitchen which is completely artificially lit in order to force compliance with the Standard for the living room. In this case an average daylight factor of 1.5% or more might be acceptable.

- 4.8. We have therefore adopted an alternative target of 1.5% for LKDs in our assessment.
- 4.9. For good daylight distribution, at least 80% of the area of the working plane in a room should lie within the no-sky line (**NSL**) to receive direct skylight) and the room depth criterion (**RDC**) should be satisfied.

Sunlight to new dwellings

- 4.10. In housing, sunlight should be assessed in living rooms and conservatories. The amount of sunlight reaching the interior of a space is measured by calculating the percentage of annual probable sunlight hours (**APSH**) reaching the centre of each window.
- 4.11. The BRE guide recommends that living rooms and conservatories should receive at least 25% APSH, including least 5% of APSH in the winter months between 21 September and 21 March. Where groups of dwellings are planned, site layout design should aim to maximise the number of dwellings meeting this recommendation.

² BRE Client Report (paragraph 2.3.5) dated 5 March 2019 for Reardon and Lowder Houses, Wapping on behalf of London Borough of Tower Hamlets (LBTH planning application reference PA/18/03541/A1)

Existing neighbouring buildings and amenity spaces

Daylight to neighbouring buildings

- 4.12. If the head of the new development subtends an angle of more than 25° measured from the centre of the lowest affected window in an existing neighbouring building in a plane perpendicular to the window wall, then a more detailed check is needed to find the loss of skylight.
- 4.13. The more detailed tests are:
- vertical sky component (**VSC**) at the centre of each main window, which measures the total amount of skylight available; and
 - no-sky line (**NSL**) on the working plane inside a room, where room layouts are known, which measures the area that can receive direct skylight and assesses the distribution of daylight around the room.
- 4.14. Loss of daylight resulting from development will be noticeable if either:
- the VSC at the centre of the window will be reduced to both less than 27% and less than 0.8 times its former value, or
 - the area of the working plane in a room that is enclosed by the no-sky line (NSL) and can receive direct skylight will be reduced to less than 0.8 times its former value.
- 4.15. The VSC test need only be run where room layouts are known, for example from planning or estate agents' records. The author of the BRE Guide, Dr Littlefair, recommends not running the NSL test using estimated layouts because it can give inaccurate findings.³
- 4.16. In respect of these numerical guidelines, the BRE guide 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.*
- 4.17. In respect of the windows and rooms to be assessed, the BRE guide states:
- The guidelines given here are intended for use for rooms in adjoining dwellings where daylight is required, including living rooms, kitchens and bedrooms.*
- 4.18. In housing, living rooms, dining rooms and kitchens have a greater requirement for daylight. Bedrooms should also be analysed but are less important. Bathrooms, stairwells and other areas without a requirement for daylight need not be assessed.
- 4.19. For a bay window, the centre window facing directly outwards can be taken as the main window for the VSC calculation. If a room has two or more windows of equal size, the mean of their VSCs may be taken.
- 4.20. A third daylight test in the BRE guide is the average daylight factor (**ADF**), which assesses the average level of daylight inside a room. It is primarily intended for assessing daylight provision to new buildings, but it may also be used to assess neighbouring consented development that is not yet built and could be affected by the proposed development.
- 4.21. The ADF test can potentially be a useful supplementary test for existing neighbouring buildings to aid a more rounded judgement on the acceptability of VSC and NSL effects, as the post-development retained ADF values may be checked against the minimum recommendations for new dwellings. They are 1% for bedrooms, 1.5% for living rooms and 2% for kitchens.

³ BRE Client Report dated 5 March 2019 for a review at Reardon and Lowder Houses, Wapping on behalf of London Borough of Tower Hamlets (Planning application reference PA/18/03541/A1)

- 4.22. Strictly speaking, in multi-purpose rooms, such as open-plan living/kitchen/dining rooms (LKDs), the target for kitchens should apply. However, planning authorities frequently accept the living room target (1.5% ADF) as a suitable alternative target for LKDs in modern dense housing developments. That view is supported by the author of the BRE guide, Dr Paul Littlefair, who explains it thus⁴:

Where a room has a shared use, the British Standard states that the higher minimum value should apply. However, local authorities frequently accept the living room standard for a shared kitchen/living room, as a small kitchen would not be considered as a habitable room. This is a practical approach, as it is seldom in the final resident's interest to have a closed off, small kitchen which is completely artificially lit in order to force compliance with the Standard for the living room. In this case an average daylight factor of 1.5% or more might be acceptable.

Sunlight to neighbouring buildings

- 4.23. In designing new development, care should be taken to safeguard the access to sunlight for existing dwellings and any nearby non-domestic buildings where there is a particular requirement for sunlight.
- 4.24. Obstruction to sunlight may become an issue if part of the development is situated within 90° of due south of a main window wall of an existing building, and in the section drawn perpendicular to this existing window wall, the new development subtends an angle greater than 25° to the horizontal measured from the centre of the lowest window to a main living room.
- 4.25. The amount of sunlight reaching a room is measured by calculating the percentage of annual probable sunlight hours (APSH) at the centre its windows.
- 4.26. If, following development, the APSH will be greater than 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.
- 4.27. Sunlight will be adversely affected if the centre of the window will:
- receive less than 25% APSH or less than 5% APSH during the winter months (21 September to 21 March); and
 - less than 0.8 times its former sunlight hours during either period; and
 - the reduction in sunlight over the whole year will be greater than 4% APSH.
- 4.28. All main living rooms of dwellings, and conservatories, should be checked if they have a window facing within 90° of due south.
- 4.29. When asked to clarify whether bedrooms should be assessed, the author of the BRE guide, Dr Paul Littlefair, wrote:

"The BRE Report 'Site layout planning for daylight and sunlight: a guide to good practice' recommends that 'all main living rooms of dwellings, and conservatories, 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.' Normally we would not include loss of sunlight to bedrooms in a detailed analysis; and loss of sunlight to bedrooms would not be treated as a material issue except in bedrooms that also comprised a living space, for example a bed sitting room in an old people's home. Loss of diffuse daylight to bedrooms does need to be taken into account, as stated in paragraph 2.2.2 of the BRE Report." ⁵

- 4.30. Our assessment has therefore assessed the loss of sunlight to living rooms, conservatories and winter gardens.

⁴ BRE Client Report (paragraph 2.3.5) dated 5 March 2019 for Reardon and Lowder Houses, Wapping on behalf of London Borough of Tower Hamlets (LBTH planning application reference PA/18/03541/A1)

⁵ BRE letter dated 16 December 2014

5. Categorisation of magnitudes of impact and significance of effects

- 5.1. In our summary tables, we have counted the number of impacts that would be inside and outside the BRE guidelines and categorised the latter according to their magnitude of impact. There is no industry-standard scale and this study adopts the approach in Table 1 below.

Table 1 – Categorisation of magnitudes of impact on existing neighbouring properties

Impact inside BRE guidelines	Impact outside BRE guidelines		
	0.70-0.79 times former value (21% to 30% loss)	0.60-0.69 times former value (31% to 40% loss)	<0.60 times former value (>40% loss)
Negligible impact	Low adverse impact	Medium adverse impact	High adverse impact

- 5.2. To understand the significance of effect on a building, it is necessary to consider both the number and magnitude of impacts and a range of other factors. Appendix I of the BRE guide, which is intended for use in Environmental Impact Assessments, provides the following advice on ascribing significance to effects:

Adverse impacts occur when there is a significant decrease in the amount of skylight and sunlight reaching an existing building where it is required, or in the amount of sunlight reaching an open space.

The assessment of impact will depend on a combination of factors, and there is no simple rule of thumb that can be applied.

Where the loss of skylight or sunlight fully meets the guidelines, the impact is assessed as negligible or minor adverse. Where the loss of light is well within the guidelines, or only a small number of windows or limited area of open space lose light (within the guidelines), a classification of negligible impact is more appropriate. Where the loss of light is only just within the guidelines, and a larger number of windows or open space area are affected, a minor adverse impact would be more appropriate, especially if there is a particularly strong requirement for daylight and sunlight in the affected building or open space.

Where the loss of skylight or sunlight does not meet the guidelines, 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; and*
- *there are particular reasons why an alternative, less stringent, guideline should be applied.*

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; and*
- *the affected indoor or outdoor spaces have a particularly strong requirement for skylight or sunlight, e.g. a living room in a dwelling or a children's playground.*

6. Flexible application of the guidelines and alternative target values

- 6.1. As noted in paragraph 2.4 above, the BRE guide states that its default numerical guidelines are not mandatory and must be interpreted flexibly because natural lighting is only one of many factors in site layout design. In certain circumstances, such as city centres or areas 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.
- 6.2. The site is situated in an Opportunity Area surrounded by the Station Hill development, therefore a higher degree of obstruction is to be expected.
- 6.3. We set out below some examples of a flexible approach to applying the BRE guidelines that are of relevance.

Reasonableness of retained values in a site's context

- 6.4. One example of flexible application of the guidelines was demonstrated in the Inspector's appeal decision for a development of the Whitechapel Estate site between Varden Street and Ashfield Street, London E1 in the London Borough of Tower Hamlets in February 2018 (Appeal Ref: APP/E5900/W/17/3171437).
- 6.5. In the aforementioned case the Inspector found that materially adverse impacts on daylight were nonetheless acceptable. He noted that development that resulted in a proportion of residual VSC values in the mid-teens, with a smaller proportion in the bands below 15% VSC, have been found acceptable in major developments across London. More specifically, the Inspector stated:

108. The BRE document offers guidance on generally acceptable standards of daylight and sunlight, but advises that numerical values are not to be rigidly applied and recognises the importance of the specific circumstances of each case. Inner city development is one of the examples where a different approach might be justified. This is specifically endorsed by the [Mayor of London's] Housing SPG, which calls for guidelines to be applied sensitively to higher density developments, especially in (among others) opportunity areas and accessible locations, taking into account local circumstances, the need to optimise housing capacity, and the scope for the character and form of an area to change over time. ... I agree with the appellants that blanket application of the BRE guide optimum standards, which are best achieved in relatively low-rise well spaced layouts, is not appropriate in this instance.

109. The SPG advises that the daylight impact on adjacent properties should be assessed drawing on "broadly comparable residential typologies within the area and of a similar nature across London"...

112. The figures [from comparable typologies from a range of example sites across Central London analysed by the appellants, comprising both traditional urban streets and recently permitted areas of significant development] show that a proportion of residual Vertical Sky Component ('VSC') values in the mid-teens have been found acceptable in major developments across London. This echoes the Mayor's endorsement in the preSPG decision at Monmouth House, Islington that VSC values in the mid-teens are acceptable in an inner urban environment. They also show a smaller proportion in the bands below 15%...

113. I acknowledge that a focus on overall residual levels could risk losing sight of individual problem areas. It is accepted that light is only one factor in assessing overall levels of amenity, but I consider that the trade-off with other factors, such as access to public transport or green space, is likely to be of more relevance to an occupier of new development than to an existing neighbour whose long-enjoyed living conditions would be adversely affected by new buildings. However, I also consider that Inner London is an area where there should generally be a high expectation of development taking place. This is particularly so in the case of the appeal site, where the Whitechapel Vision Masterplan and the City Fringe Opportunity Area Planning Framework have flagged the desirability of high density development. Existing residents would in my view be prepared

for change and would not necessarily expect existing standards of daylight and sunlight to persist after development.

- 6.6. Another approach to assessing the reasonableness of retained daylight levels, which may be advocated for where buildings are consented and are not yet built and occupied is to compare the retained ADF levels with the BRE recommendations for new dwellings.
- 6.7. We have therefore assessed the ADF levels in the proposed dwellings at first to fourth level that face the Site and considered whether acceptable daylight levels would nonetheless be retained by reference to the recommendations in the BRE guide for new dwellings. For the reasons explained at paragraph 4.22 above we have adopted an alternative target of 1.5% for LKDs.
- 6.8. Ultimately, it is for the planning authority to judge whether affected properties would be left with acceptable levels of daylight and sunlight in their neighbourhood context, having regard to all relevant planning policies and guidance and balanced against the merits of the proposed development.

Proximity of neighbouring building to site boundary

- 6.9. Another important issue is whether the existing building is itself a good neighbour, standing a reasonable distance from the boundary and taking no more than its fair share of light. Appendix F of the BRE guide gives further guidance. This involves setting alternative target values generated from the layout dimensions of the existing neighbouring building and its position relative to the boundary. To ensure that new development matches the height and proportions of existing buildings, the VSC and APSH targets for the neighbouring 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.
- 6.10. In the Inspector's appeal decision for a development at Enterprise House, 21 Buckle Street, London E1 8NN in the London Borough of Tower Hamlets dated 17 December 2018 (Appeal Ref: APP/E5900/W/17/3191757) he interpreted this as applying to buildings built at the back edge of pavement and whose windows were therefore "effectively on the site boundary". He stated:

19. ... The BRE Guide recognises that windows that are unusually close to the boundary take more than their fair share of light. This is an acknowledgement that the first built scheme of a local cluster could otherwise prevent the full potential of adjacent sites from being realised.

*20. In such inequitable circumstances the Rainbird judgement found that 'If an existing building has been so designed that, whether by the inclusion of balconies or overhangs, it makes relatively larger reductions in daylight unavoidable even if there is a modest new obstruction opposite, that design could be seen as taking for the existing building 'more than their fair share of light' in the same way the BRE Guide regards a building that has windows that 'are unusually close to the site boundary' as doing; in each case, a greater reduction in daylight and sunlight may be unavoidable if one site is not to be unfairly prejudiced by how another has been developed.'*⁶

*21. In such a situation the BRE Guide advises that 'To ensure that new development matches the height and proportion 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.'*⁷

22. The appellants carried out an assessment of the impact on all affected windows through a range of criteria, including a mirror image exercise with the 28 storey Altitude/Goldpence Apartments building...

23. The mirror-image exercise, although not quite to the letter of the guidelines, gives a clear indication that overall, in this more equitable arrangement, many more flats in the Altitude/Goldpence Apartments building would be affected and many more in the upper

⁶ Rainbird, R (on the application of) v The Council of the London Borough of Tower Hamlets [2018]

⁷ Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice (2nd Edition, 2011) - Appendix F para F5.

storeys would have a material deterioration in daylight and sunlight levels similar to those in the lower storeys. Such an impact would be considered acceptable, in terms of a fair share of light. In my view this provides a reasonable justification for a greater reduction in daylight and sunlight levels in the surrounding buildings as a result of this proposal than might otherwise be considered appropriate. By strictly applying the BRE guidelines, development of the site would be unfairly prejudiced.

Self-obstructing balconies, wings and other projections

- 6.11. Balconies and projecting wings to existing neighbouring buildings obstruct the available daylight and sunlight and can therefore cause relative reductions in light to be amplified. The BRE guide states:

2.2.11 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 area receiving direct skylight, for both the existing and proposed situations, without the balcony in place. For example, if the proposed VSC with the balcony was under 0.8 times the existing value with the balcony, but the same ratio for the values without the balcony was well over 0.8, this would show that the presence of the balcony, rather than the size of the new obstruction, was the main factor in the relative loss of light.

2.2.12 A larger relative reduction in VSC may also be unavoidable if the existing window has projecting wings on one or both sides of it, or is recessed into the building so that it is obstructed on both sides as well as above.

3.2.9 Balconies and overhangs above an existing window tend to block sunlight, especially in summer. Even a modest obstruction opposite may result in a large relative impact on the sunlight received. One way to demonstrate this would be to carry out an additional calculation of the APSH, for both the existing and proposed situations, without the balcony in place. For example, if the proposed APSH with the balcony was under 0.8 times the existing value with the balcony, but the same ratio for the values without the balcony was well over 0.8, this would show that the presence of the balcony, rather than the size of the new obstruction, was the main factor in the relative loss of sunlight.

- 6.12. Clearly, balconies, wings and other projections from buildings can be a factor in the relative light loss to such buildings. In such instances it can be helpful to run a supplementary assessment with the projections removed, in order to understand the degree to which they contribute to the relative light loss.

Deep, side-lit rooms

- 6.13. Another example where the standard numerical guidelines need to be applied sensibly is in relation to deep, side-lit rooms. The BRE guide states:

If an existing building contains rooms lit from one side only and greater than 5 m deep, then a greater movement of the no sky line may be unavoidable.

7. Scope of the assessment

New development

- 7.1. Within the proposed development, we have assessed daylight and sunlight to the proposed habitable room at first to fourth floor level.
- 7.2. Daylight has been assessed to all types of habitable room.
- 7.3. Sunlight has been assessed to main living rooms and winter gardens only, where they have at least one window facing within 90° of due south.

Neighbouring buildings

- 7.4. The principal recommendations in the BRE guide relate to residential buildings. Its guidelines on daylight are intended for use for rooms in neighbouring dwellings where daylight is required, including living rooms, kitchens and bedrooms (BRE paragraph 2.2.2). Its guidelines on sunlight apply to all main living rooms of neighbouring dwellings and conservatories that have a window facing within 90° of due south (BRE paragraph 3.2.3).
- 7.5. Consequently, our assessment has been scoped to include nearby residential accommodation, including the Station Hill development, which is currently under construction, as is common practice for studies for planning applications.
- 7.6. We identified the properties that are in residential use from a site visit and online research, including the Valuation Office Agency council tax list, local authority planning records, and estate agency websites.
- 7.7. We have run the BRE daylight and sunlight tests in the existing baseline condition including future neighbouring properties under construction and the proposed development scenario. This establishes the levels that would be retained in the proposed development condition and the degree to which they change from the existing baseline.

8. Information used in our technical study

- 8.1. We have undertaken our technical study using a 3D computer model built in AutoCAD and specialist analysis software, which runs the assessments recommended in the BRE guide.
- 8.2. We compiled our 3D computer model from the following information:
 - 8.2.1. 3D computer model of the existing buildings on the Site and the contextual massing produced from photogrammetry (aerial photography) supplied by AccuCities Ltd, subsequently enhanced by us with the more detailed information listed below
 - 8.2.2. Measured survey information has been provided by 3D Services (South East) Limited dated June 2017.
 - 8.2.3. Floor plans for neighbouring buildings, where available
 - 8.2.4. Proposed development: 3D model supplied by Stefan Shaw Studio in May 2022 (file name: 220215-FRIAR ST-PROPOSED 3D MODEL)
- 8.3. To aid accuracy of the assessment and interpretation of the results, we carried out online searches to obtain the floor plans for the neighbouring buildings referred to above, including from online planning application records and general estate agency websites. This is the approach recommended in the Professional Guidance Note, 'Daylighting and sunlighting' (1st edition, 2012), published by the Royal Institution of Chartered Surveyors, which states:

As a minimum, and subject to any limitations relating to a client instruction, surveyors should undertake searches of the local authority's planning portal to establish existing or proposed room layouts of neighbouring properties if they are available. This will ensure a robust approach and enable the surveyor to produce reliable information for daylight distribution analysis, or if average daylight factor (ADF) tests are appropriate ... Surveyors should also use the internet to search for other relevant information, including estate agent details, which commonly include plans of properties that can also be useful in determining a room layout or use.

- 8.4. Our research yielded the information listed in **Table 2** below. The plan ref. refers to the numbering on the location plan at Appendix 2.

Table 2 - Information on internal layouts of neighbouring properties

Plan ref.	Neighbouring property	Information used
1	Block E	Plans from planning consent ref 201537
2	Block F	Plans from planning consent ref 201533
3	Garrard House	Plans from planning consents 141277 and 160328
4	Projection West	Estate Agent Plans
5	125 Friar Street	Plans from planning consent ref 061152

- 8.5. Where we found plans for neighbouring properties, we used them to model their rooms. Where we were unable to find plans, we modelled their rooms based on estimated dimensions, typically adopting a generic 4m-deep room for residential premises, unless the style of building suggested otherwise.
- 8.6. Our 3D computer model is shown on our spot-height drawings at Appendix 2.
- 8.7. For the ADF assessment we used the window and room parameters stated in **Table 3**.

Table 3 – Window and room parameters used in ADF calculations

Parameter	Value – Station Hill Development	Value – Proposed Dwellings
Maintenance factor (dirt on glass)	0.92 for vertical windows with normal exposure in residential developments in urban locations with good maintenance	0.92 for vertical windows with normal exposure in residential developments in urban locations with good maintenance
Diffuse light transmittance of glazing	0.68 for double glazing	0.68 for double glazing
Frame and glazing bar factor	0.8 for metal frames and large panes	0.8 for metal frames and large panes
Internal surface reflectance	0.85 for white ceilings	0.85 for white ceilings
	0.81 for pale cream walls	0.81 for pale cream walls
	0.4 for light wood floors	0.4 for light wood floors

Limitations and assumptions

- 8.8. In compiling our 3D computer model for our technical study, we have sought to be as accurate as reasonably possible within the scope of our instruction. We have relied upon the information noted above.
- 8.9. Whilst we have used plans for neighbouring buildings where available, we have typically made reasonable assumptions as to their internal floor levels and wall thicknesses.
- 8.10. We have used proven and trusted specialist computer software (Waldram Tools for AutoCAD®) to run the calculations recommended in the BRE guide.
- 8.11. To the best of our knowledge, the information and advice contained in this report is accurate at the date of issue, based on the information provided to or procured by us prior to its production.

9. Light within the proposed development

Daylight to new dwellings

ADF

- 9.1. The results of the ADF test for the assessed proposed dwellings are set out in the table of results at Appendix C. The level of adherence to the BRE numerical guidelines is summarised in **Table 4** below.

Table 4 - Number of rooms meeting ADF guidelines

Floor level	Total number of rooms tested	Number of rooms meeting ADF guidelines	Number of rooms below ADF guidelines
First	25	11	14
Second	33	21	12
Third	33	23	10
Fourth	33	26	7
Total	124	81	43

- 9.2. Table 4 shows that of the 124 rooms assessed at first to fourth level, 81 (65%) would satisfy the BRE guidelines for ADF. Of the 43 rooms that fall below the suggested BRE guidelines, 24 are bedrooms and of the remaining 19 main living areas, 11 are within 20% of the BRE guidelines.
- 9.3. The scheme is situated in a regeneration area with the overall pass rate improving on the upper floors. The isolated infringements on the lower floor shows that the retained levels of light and overall compliance rate will be commensurate to the neighbouring Station Road development.

Additional recommendations: room depth and no-sky line

Room depth

- 9.4. The results of the room depth test are set out in the table of results at Appendix C. The level of adherence to the BRE recommendations are summarised in **Table 5** below.

Table 5 - Number of rooms meeting room depth guidelines

Floor level	Total number of rooms tested	Number of rooms meeting room depth guidelines	Number of rooms not meeting room depth guidelines
First	25	25	0
Second	33	33	0
Third	33	33	0
Fourth	33	33	0
Total	124	124	0

- 9.5. Table 5 shows that all 124 (100%) rooms assessed would satisfy the room depth guidelines.

NSL

- 9.6. The results of the NSL test are set out in the table of results at Appendix C. The level of adherence to the BRE recommendations are summarised in **Table 6** below.

Table 6 - Number of rooms meeting room depth guidelines

Floor level	Total number of rooms tested	Number of rooms meeting room depth guidelines	Number of rooms not meeting room depth guidelines
First	25	8	17
Second	33	11	22
Third	33	16	17
Fourth	33	20	13
Total	124	55	69

- 9.7. **Table 6** shows that of the 124 rooms assessed, 55 (65%) would satisfy the NSL guidelines. Although, 96 (77%) would meet the alternative NSL target value of 50% coverage, which is considered appropriate for a town centre regeneration scheme. Of the 28 rooms that fall below the alternative target value, 18 are bedrooms which are generally considered less important in daylight terms.

Sunlight to new dwellings

- 9.8. The results of the sunlight analysis of the main living rooms within the proposed scheme are tabulated at Appendix 3 and summarised in **Table 7** below.

Table 7 - Number of main living rooms meeting APSH guidelines

Location within the proposed development	Total number of rooms tested	Number of rooms meeting APSH guidelines	Number of rooms below APSH guidelines
First	7	3	4
Second	10	3	7
Third	10	3	7
Fourth	10	3	7
Total	37	12	25

- 9.9. Table 7 shows that of the 37 rooms assessed, 12 (32%) will satisfy the APSH guidelines. Due to the orientation of the scheme several of the rooms face almost directly east and therefore their ability to receive sunlight is hindered by the orientation of the development site. It is worth noting, that the rooms facing directly south generally receive very good levels of direct sunlight.

10. Baseline condition for neighbouring properties

- 10.1. We have assessed the impacts of the proposed development relative to the existing baseline condition.
- 10.2. The existing baseline scenario and the proposed development scenario are shown on our spot-height drawing nos. 21384-SPT-003 respectively at Appendix 2.
- 10.3. The daylight and sunlight levels in the existing baseline and proposed development conditions are shown in the results tables Appendix .
- 10.4. The levels in the proposed scenario are then compared with those in the baseline scenario so that the loss of natural light can be quantified and compared with the BRE numerical guidelines.
- 10.5. Window maps for the assessed buildings are attached at Appendix 2.

11. Effects of the proposed development on neighbouring properties

11.1. We assessed the effects of the proposed development on the following properties:

- Station Hill Development: Block E
- Station Hill Development: Block F
- Garrard House
- Projection West
- 125 Friar Street

Daylight to neighbouring properties

VSC and NSL

11.2. The results of the VSC and NSL analyses of the neighbouring properties are tabulated in Appendix and summarised in [Table 8](#) and [Table 9](#) below.

Table 8 - Number of rooms experiencing VSC effects as a result of the proposed development

Property address	No. of windows tested	Windows inside VSC guidelines		Windows outside VSC guidelines					
				Low reduction 0.79-0.70 x FV		Medium reduction 0.69-0.60 x FV		High reduction <0.60 x FV	
		No.	%	No.	%	No.	%	No.	%
Block E	543	440	81%	39	7%	17	3%	47	9%
Block F	156	114	73%	19	12%	6	4%	17	11%
Garrard House	67	54	81%	12	18%	1	1%	-	-
Projection West	90	83	92%	7	8%	-	-	-	-
125 Friar St	27	19	70%	8	30%	-	-	-	-
Totals:	883	710	80%	85	10%	24	3%	64	7%

Table 9 - Number of rooms experiencing NSL effects as a result of the proposed development

Property address	No. of rooms tested	Rooms inside NSL guidelines		Rooms outside NSL guidelines					
				Low reduction 0.79-0.70 x FV		Medium reduction 0.69-0.60 x FV		High reduction <0.60 x FV	
		No.	%	No.	%	No.	%	No.	%
Block E	453	399	88%	13	3%	10	2%	31	7%
Block F	144	115	80%	12	8%	5	3%	12	8%
Garrard House	35	30	86%	2	6%	3	9%	-	-
Projection West	74	55	74%	13	18%	3	4%	3	4%
125 Friar St	3	3	100%	-	-	-	-	-	-
Totals:	709	602	85%	40	6%	21	3%	46	6%

11.3. Of the 883 habitable windows assessed in the 5 neighbouring properties, 710 (80%) would satisfy the VSC guidelines and of the 709 neighbouring rooms, 601 (85%) would satisfy the NSL guidelines.

11.4. The impacts on VSC and NSL to each neighbouring property is explained in more detail below.

Block E: Station Hill Development

11.5. This is the 11-storey residential building situated to the west of the development site, which is currently under construction and forms part of the wider Station Hill masterplan. The assessment has been based on floor plans obtained from the planning archive.

- 11.6. The VSC results indicate that of the 543 windows considered, 440 (81%) satisfy the BRE guidelines and a further 39 (7%) will only experience a small reduction beyond the BRE guidelines. Of the 64 that have the potential to experience a medium to high reduction, the majority directly face the development site, are positioned close to the boundary or have their ability to receive daylight compromised by Block F. Therefore, a wider reduction in VSC is unavoidable if the proposed development is of a similar bulk and scale is to be constructed on the development site.
- 11.7. The NSL results indicate that of the 453 habitable rooms considered, 399 (88%) satisfy the BRE guidelines and further 13 (3%) only experience a low reduction beyond the BRE guidelines. Of the remaining 41 (9%) rooms that have the potential to experience a medium to high reduction beyond the BRE guidelines, 19 serve bedroom which are generally considered less important in daylight terms. There is the potential for some rooms to experience a high reduction in NSL levels as a result of the development proposals, although this is largely due to the design and layouts of Blocks E and F, which have obstructing wings and windows/rooms close to the boundary.
- 11.8. When considering daylight levels within newly constructed residential dwellings in a town centre location, it is also worth considered the ADF levels. The ADF method is used for establishing whether new habitable rooms will benefit from acceptable levels of daylight.
- 11.9. The ADF results indicate that of the 453 habitable rooms considered, 304 (67%) will satisfy the BRE guidelines for new development. This figure will reduce by 10 rooms to 294 (65%) in the post development condition. This shows that daylight levels within Block E will remain similar in the post development condition.
- 11.10. Due to the layout of Block E and positioning of Block F, several of the windows/rooms have their potential to receive daylight compromised. Without the proposed development in place, only 22% of the windows within Block E satisfy the BRE guidelines, this reduces to 17% with the proposed development in place. The windows/rooms within Block E that have the potential to experience a medium to high reduction beyond the BRE guidelines, do so because they benefit from daylight level over the development site. Although, all these dwellings will remain with daylight levels similar to or greater than large parts of Block E.
- 11.11. Overall, due to the design and proximity of Block E in relation to the development site and wider masterplan, it is unavoidable that a reduction in daylight beyond the BRE guidelines will occur. However, the daylight results show that the daylight implications to Block E should be considered acceptable as the retained light levels within Block E are similar to the pre-development condition.

Block F: Station Hill Development

- 11.12. This is the 12-storey residential building located to the north of the development site. The assessment has been based on floor plans obtained from the planning archive.
- 11.13. The VSC results indicate that of the 156 windows considered, 114 (73%) will satisfy the BRE guidelines and a further 19 (12%) will only experience a low reduction beyond the BRE guidelines. Of the 23 (15%) windows that have the potential to experience a medium to high reduction, 13 serve bedrooms. Of the remaining 10 windows, 7 serve dual aspect rooms which benefit from another window meeting the BRE guidelines.
- 11.14. The NSL results indicate that of the 144 habitable rooms considered, 115 (80%) satisfy the BRE guidelines, with a further 12 (8%) only experiencing a minor reduction beyond the BRE guidelines. Of the 17 (11%) rooms that have the potential to experience a medium to high reduction, 12 serve bedrooms and 5 main living areas that are located close to the boundary and currently have a relatively open outlook across the development site, where a reduction in daylight levels beyond the BRE guidelines is unavoidable if any massing is added to the development site.
- 11.15. As mentioned above, it is appropriate to also consider the ADF levels to habitable rooms which have consent in a wider regeneration area. The ADF results indicate that of the 144 main habitable rooms, 99 (69%) will satisfy the BRE guidelines for new development. This will reduce by 18 rooms to 81 (56%) in the post development condition.
- 11.16. The design of Block F has positioned windows/room close to the boundary of the development. As a result, a small number of rooms have the potential to experience a high reduction in daylight levels.

However, generally the retained daylight levels indicate that Block F will remain with similar levels of daylight to the wider Station Hill development in the post development condition.

Garrard House

- 11.17. This is the 6-storey residential property located to the east of the development site. The assessment has been based on drawings obtained from the planning archive.
- 11.18. The VSC results indicate that of the 67 windows considered for assessment, 54 (81%) satisfy the BRE guidelines, with a further 12 (18%) experiencing a low reduction beyond the BRE guidelines. Only 1 window has the potential to experience a medium reduction, although the VSC to this window will only experience a small quantum of loss, reducing from 3.4% currently to 2.3% in the post development condition.
- 11.19. The NSL results indicate that of the 35 habitable rooms considered, 30 (85%) will satisfy the BRE guidelines, with the further 2 (6%) experiencing a low reduction beyond the BRE guidelines. Only 3 rooms have the potential to experience a medium reduction, 2 of which already have their ability to receive daylight compromised and will only experience a modest change in NSL levels. The final room retains NSL coverage to over 50% of its area, which is generally considered acceptable in a regeneration area.
- 11.20. Although ADF is used to consider daylight levels within new habitable rooms, it is a useful supplementary assessment to help evaluate the potential daylight implications to neighbouring properties. The ADF results indicate that of the 35 habitable rooms considered, 15 (43%) currently satisfy the BRE guidelines for new developments. This will remain the same in the post development condition.
- 11.21. Overall, this property generally meets the BRE recommendations in the post development condition, with only relatively small actual changes in daylight levels.

Projection West

- 11.22. This is the 8-storey residential property located to east of the development site. The assessment has been based on estate agency floor plans.
- 11.23. The VSC results indicate that of the 90 windows considered, 83 (92%) satisfy the BRE guidelines, with the remaining 7 windows only experiencing a low reduction beyond the BRE guidelines.
- 11.24. The NSL results indicate that of the 74 habitable rooms considered, 55 (74%) will satisfy the BRE guidelines, with a further 13 (18%) only experiencing a small reduction beyond the BRE guidelines. Of the 6 rooms that have the potential to experience a medium to high reduction, 3 retain NSL coverage of over 50% of their area, with the remaining 3 rooms maintaining coverage to between 40% - 49% of their area.
- 11.25. The ADF results indicate that of the 74 habitable rooms considered, 35 (47%) satisfy the BRE guidelines. This will reduce by 3 to 32 (43%) in the post development condition.
- 11.26. Overall, the daylight levels indicate that the proposed scheme will leave this property with acceptable levels of daylight in the post development condition.

125 Friar Street

- 11.27. This is the 4-storey building located to the south of the development site with commercial at ground floor level. The assessment has been based on drawings obtained from the planning archive.
- 11.28. The VSC results indicate that of the 27 rooms considered for assessment, 19 (70%) will satisfy the BRE guidelines, with a further 8 (30%) only experiencing a low reduction beyond the BRE guidelines.
- 11.29. The NSL results indicate that all 3 (100%) habitable rooms considered for assessment will satisfy the BRE guidelines.
- 11.30. Overall, the daylight level show that this property will remain well-lit in the post development condition.

Sunlight to neighbouring properties

11.31. The results of the annual and winter sunlight analyses are tabulated in Appendix B and summarised **Table 8** below.

Table 8 – Number of rooms experiencing APSH effects as a result of the proposed development

Property address	No. of rooms tested	Rooms inside APSH annual guidelines		Rooms outside APSH annual guidelines					
				Low reduction 0.79-0.70 x FV		Medium reduction 0.69-0.60 x FV		High reduction <0.60 x FV	
		No.	%	No.	%	No.	%	No.	%
Block E	118	112	95%	1	1%	-	-	5	4%
Block F	60	51	85%	3	5%	2	3%	4	7%
Garrard House	20	20	100%	-	-	-	-	-	-
Projection West	25	24	96%	1	4%	-	-	-	-
125 Friar St	-	-	-	-	-	-	-	-	-
Totals:	223	207	93%	5	2%	2	1%	9	4%

11.32. **Table 8** shows that of the 223 rooms assessed in 4 neighbouring properties, 207 (93%) would satisfy the BRE guidelines for APSH annual sunlight allowance.

11.33. The APSH results indicate that only 11 (5%) rooms have the potential to experience a medium to high reduction beyond the BRE guidelines. Of the 5 rooms in Block E that have the potential to experience a high reduction, 3 will remain with an APSH greater than 15%, which is generally considered acceptable for a regeneration area. With regards to the rooms in Block F that have the potential to experience a high reduction, all of these rooms already have their ability to receive sunlight hindered by the design and layout of Block F.

11.34. The APSH results show that the proposed scheme will generally leave the neighbouring residential properties with acceptable levels of sunlight.

12. Conclusion

- 12.1. The Site is in an urban location in the centre of Reading directly adjacent to the Station Hill masterplan development.
- 12.2. We assessed the daylight and sunlight provision to a selected sample of the new dwellings within the proposed development. We also assessed the potential effects of the proposed development on daylight and sunlight to surrounding residential properties.
- 12.3. We ran our assessments using methodologies recommended in the BRE guide.
- 12.4. The advice contained in the BRE guide is not mandatory and its numerical guidelines should be interpreted flexibly particularly in high density urban regeneration areas where a degree of obstruction is unavoidable if development is to match the height of neighbouring building.
- 12.5. The daylight results show that in VSC terms, 90% of the neighbouring windows will experience no more than a low adverse reduction in daylight. The NSL results indicate that 91% of the neighbouring habitable rooms will experience no more than a low adverse reduction. The daylight results generally show a good adherence with the BRE guidelines and the proposed massing by Stefan Shaw Studios performs well when compared to other schemes in the area.
- 12.6. The sunlight results indicate that 95% of the neighbouring living rooms will experience no more than a low adverse reduction.
- 12.7. The internal daylight and sunlight results show that the proposed dwellings will benefit from acceptable levels of light for the immediate surrounding area.
- 12.8. In conclusion, it is submitted that the layout of the proposed development is consistent with the Council's local planning policy on daylight and sunlight, particularly having regard to paragraph 125(c) of the National Planning Policy Framework.

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Chartered Surveyors

Appendix 1

Assessment methodology and glossary

1. This appendix explains the daylight and sunlight assessment methodology recommended in BRE Report 209, '*Site Layout Planning for Daylight and Sunlight: A guide to good practice*' (2011) and provides a glossary of the terminology used.

Assessment methodology

*Daylight and sunlight in new development*Daylight to new dwellings*Vertical sky component (VSC)*

2. At the very early stages in design and at outline planning application stage, when room layouts and window locations may be undecided, daylight availability may be checked by calculating the VSC at a series of points on each main face of the building.
3. Although the BRE guide recommends setting the calculation points at 1.6 m above the ground (or base of the lowest storey) and no more than 5 m apart, with computer software it is possible to set up a grid of points across the facades.
4. The guide advises that if the VSC is found to change rapidly along a façade it is worthwhile, if possible, siting windows where most daylight is available.
5. The amount of daylight a room needs depends on what it is being used for. But roughly speaking, if the VSC is:
 - at least 27% (obstruction angle less than 25°), conventional window design will usually give reasonable results;
 - between 15% and 27% (obstruction angle between 25° and 45°), special measures (for example, larger windows or changes to room layout) might be needed to provide adequate daylight;
 - between 5% and 15% (obstruction angle between 45° and 65°), it is very difficult to provide adequate daylight unless very large windows and/or light internal surface finishes are used;
 - less than 5% (obstruction angle greater than 65°), it is often impossible to achieve reasonable daylight, even if the whole window wall is glazed.

Average daylight factor (ADF)

6. The BRE guide advises that daylight provision in new rooms can be checked using the average daylight factor (ADF). The ADF is a measure of the overall amount of daylight in a space.
7. Living rooms and kitchens need more daylight than bedrooms. Areas without a special requirement for daylight, like bathrooms, stairwells, garages and storage areas, need not be assessed.
8. Appendix C of the BRE guide gives guidance on how to calculate the ADF. Where there are multiple windows, the ADF due to each one can be added together. The ADF due to each window can be calculated using the following formula:

$$ADF = \frac{TMA_w\theta}{A(1 - R^2)}$$

where:

T is the diffuse visible transmittance of the glazing (for clean, clear double glazing with a low emissivity coating, a value of 0.68 can be used);

M is a maintenance factor, allowing for the effects of dirt;

A_w is the net glazed area of the window (m²);

A is the total area of the room surfaces: ceiling, floor, walls and windows (m^2);

R is their average reflectance based on the reflectances of the room finishes (if room finishes are not known a default value of 0.5 can be taken for fairly light-coloured rooms);

θ is the angle of visible sky in degrees, measured from a point halfway between the inner and outer faces of the window wall.

9. Of these quantities, only θ depends on external obstruction. It can be directly related to the vertical sky component (VSC), which can be calculated using the Waldram diagram method explained in Appendix B of the BRE guide. Our computer software uses this calculation method and converts the VSC value to an equivalent angle of visible sky for use in the ADF formula.
10. A special procedure is required for floor to ceiling windows such as patio doors. If part of a window is below the height of the working plane (a horizontal plane 0.85 m above the floor in housing), this portion should be treated as a separate window. The ADF for this window has an extra factor applied to it, to take account of the reduced effectiveness of low-level glazing in lighting the room. A value equal to the floor reflectance may be taken for this factor, if this is known. If room reflectances are not known, a value of 0.15 can be taken. The ADF for the portion of the window above the working plane is calculated in the normal way without this additional factor, and the ADFs for the two portions are added together.
11. The BRE guide gives minimum values of ADF in housing of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms. It notes that with a higher ADF, indoor daylight will be sufficient for more of the year. So, although the minimum values can be used as targets for daylight in obstructed situations, achieving higher levels will give improved daylight provision.
12. The BRE guide advises that non-daylit internal kitchens should be avoided wherever possible, especially if the kitchen is used as a dining area too. It suggests that if the layout means that a small internal galley-type kitchen is inevitable, it should be directly linked to a well-daylit living room.

Additional recommendations: room depth and no-sky line (RDC and NSL)

13. Appendix C of the BRE guide makes two additional recommendations beyond ADF.
14. Firstly, the guide advises that if a daylit room is lit by windows in one wall only, the depth of the room, L , should not exceed the limiting value given by the following room depth criterion (RDC) formula:

$$\frac{L}{W} + \frac{L}{H} < \frac{2}{(1 - R_b)}$$

Where:

W is the room width

H is the window head height above floor level

R_b is the average reflectance of surfaces in the rear half of the room.

15. If L exceeds this value, the rear half of the room will tend to look gloomy and supplementary electric lighting will be required. For a typical room in a dwelling, where $W = 4$ m, $H = 2.4$ m and $R_b = 0.5$, the limiting depth L is just over 5 m.
16. Secondly, the guide advises that if a significant area of the working plane (normally more than 20%) lies beyond the no sky line (NSL) and receives no direct skylight, the distribution of daylight in the room will look poor and supplementary electric lighting will be required. Therefore, at least 80% of the area of the working plane in a room should lie within the no-sky line and receive direct skylight.
17. Our computer software plots the NSL within our 3D computer model and calculates the percentage of the room area with a view of sky from the working plane.

Sunlight to new dwellings

18. The BRE guide states:

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

Sensitive layout design of flats will attempt to ensure that each individual dwelling has at least one main living room which can receive a reasonable amount of sunlight.

The overall sunlighting potential of a large residential development may be initially assessed by counting how many dwellings have a window to a main living room facing south, east or west. The aim should be to minimise the number of dwellings whose living rooms face solely north, north east or north west, unless there is some compensating factor such as an appealing view to the north.

19. In general, a dwelling will appear reasonably sunlit if 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% of annual probable sunlight hours (**APSH**), including at least 5% of APSH in the winter months between 21 September and 21 March.
20. Where groups of dwellings are planned, site layout design should aim to maximise the number of dwellings that meet this recommendation.
21. Although the criteria applies to rooms of all orientations, if a room faces significantly north of due east or west, the guide notes they are unlikely to be met.
22. When calculating the APSH, the BRE guide advises that:

... the centre of each main living room window can be used for the calculation. In the case of a floor-to-ceiling window such as a patio door, a point 1.6 m above ground on the centre line of the window may be used.

23. It also advises that:

... a point on the inside face of the window wall should be taken. Sunlight blocked by the window reveals should not be included, but the effect of the window frames in blocking sunlight need not be taken into account. If a room has multiple windows on the same wall or on adjacent walls, the highest value of APSH should be taken. If a room has two windows on opposite walls, the APSH due to each can be added together.

24. In rooms with multiple windows, our computer software calculates the total APSH across all windows.

Sunlight to new gardens and amenity spaces

25. Sunlight should be assessed on the equinox (21 March) to new amenity spaces within proposed development, including private or shared gardens, children's playgrounds, and sitting-out areas, such as in public squares.
26. The assessment measures the percentage of each new amenity area that can receive at least two hours of sunlight on 21 March - the 'two-hours sun-on-ground' (**SOG**) test. At least 50% of each amenity area should be able to receive at least two hours of direct sunlight on 21 March.
27. Sunlight at an altitude of 10° or less is ignored, because it is likely to be blocked by planting, and fences or walls less than 1.5 metres high can also be ignored. Front gardens, driveways and hard standing for cars are usually omitted. Normally, trees and shrubs need not be included, partly because their shapes are almost impossible to predict, and partly because the dappled shade of a tree is more pleasant than a deep shadow of a building.

Daylight and sunlight to neighbouring buildings and amenity spaces

Daylight to neighbouring buildings

28. The BRE guide states:

In designing a new development or extension to a building, it is important to safeguard the daylight to nearby buildings.

The guidelines given here 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. The guidelines may also be applied to any existing non-domestic building where the occupants have a reasonable expectation of daylight; this would normally include schools, hospitals, hotels and hostels, small workshops and some offices.

29. To quantify the impact of development on daylight to a building, the BRE guide recommends two tests:

- a) calculating the vertical sky component (**VSC**) at the centre of each main window on the outside plane of the window wall, to measure the total amount of skylight available to the window; and
- b) plotting the no-sky line (**NSL**) on the working plane inside a room, where layouts are known, and measuring the area that can receive direct skylight, to assess the distribution of daylight around the room.

30. The VSC measures the skylight available at the window. The guide states:

Any reduction in the total amount of skylight can be calculated by finding the VSC at the centre of each main window ... For a bay window, the centre window facing directly outwards can be taken as the main window. If a room has two or more windows of equal size, the mean of their VSCs may be taken. The reference point is in the external plane of the window wall. Windows to bathrooms, toilets, storerooms, circulation areas and garages need not be analysed.

31. The NSL test is described thus:

Where room layouts are known, the impact on the daylighting distribution in the existing building can be found by plotting the 'no sky line' in each of the main rooms. For houses this would include living rooms, dining rooms and kitchens; bedrooms should also be analysed although they are less important. In non-domestic buildings each main room where daylight is expected should be investigated. The no sky line divides points on the working plane which can and cannot see the sky.

32. If, following development, the VSC to a neighbouring window will be greater than 27% then enough skylight should still be reaching the window. Any reduction below this level should be kept to a minimum. If the VSC will be both less than 27% and less than 0.8 times its former value, occupants of the existing building will notice the reduction in the amount of skylight. The area lit by the window is likely to appear more gloomy and electric lighting will be needed more of the time.

33. If, following development, the no-sky line moves so that the area of the existing room that can receive direct skylight will be 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.

34. A third daylight test in the BRE guide is the average daylight factor (**ADF**), which assesses the average level of daylight inside a room. It is a detailed calculation that takes account of window and room parameters, including the net glazed area of each window (after discounting frames and glazing bars), the diffuse light transmittance of the glazing, the total surface area of the room, and the reflectance of those surfaces, plus the amount of sky visible at each of the windows. It is therefore primarily intended for assessing daylight within proposed buildings, where such parameters can be readily established. It may also be used to assess neighbouring consented development that is not yet built and could be affected by the proposed development.

35. Using the ADF test for existing neighbouring buildings can potentially be a useful supplementary test to aid a more rounded and balanced judgement on the acceptability of VSC and NSL effects, as the post-development retained ADF values may be checked against the minimum recommendations for new dwellings. These are 1% in bedrooms, 1.5% in living rooms and 2% in kitchens.

Sunlight to neighbouring buildings

36. The BRE guide states:

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° 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 [as the calculation point].

37. To quantify the available sunlight, the BRE guide advises measuring the percentage of annual probable sunlight hours (**APSH**), which is defined as follows:

'probable sunlight hours' means the total number of hours in the year that the sun is expected to shine on unobstructed ground, allowing for average levels of cloudiness for the location in question.

38. The assessment calculates the percentage of APSH over the whole year (annual sunlight) and between 21 September and 21 March (winter sunlight).

39. If, following development, the APSH to a neighbouring window will be greater than 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.

40. If the available sunlight hours will be both less than the above amounts and less than 0.8 times their former value, either over the whole year or just in the winter months, then the occupants of the 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.

Glossary of terms

41. The daylight and sunlight terminology used in our report is explained below.

Term	Meaning
Annual probable sunlight hours (APSH)	The long-term average of the total number of hours during a year in which direct sunlight is expected to shine on the unobstructed ground, allowing for average levels of cloudiness for the location in question.
Average daylight factor (ADF)	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.
Daylight	Combined skylight and sunlight.
No-sky line (NSL)	The outline on the working plane of the area from which no sky can be seen. It divides points on the working plane which can and cannot see the sky.
Obstruction angle	The angular altitude of the top of an obstruction above the horizontal, measured from a reference point in a vertical plane in a section perpendicular to the vertical plane.
Room depth criterion (RDC)	The limiting depth of a room for good daylighting, where it is lit from one side only. The limiting depth is a factor of the window head height above floor level, the room width, and the average reflectance of surfaces in the rear half of the room (away from the window). Sunlight below an angle of
Sky factor	Ratio of the parts of illuminance at a point on a given plane that would be received directly through unglazed openings from a sky of uniform luminance, to illuminance on a horizontal plane due to an unobstructed hemisphere of this sky. The sky factor does not include reflected light, either from outdoor or indoor surfaces.
Sun on ground (SOG)	The measure of sunlight potential to gardens and amenity spaces. It is measured in hours on the spring equinox (21 March) at a point on the ground accounting for the latitude of the site location. Sunlight below an altitude of 10° is usually discounted as it is likely to be prevented from reaching the ground by fences, plants or other low-level obstructions.
Vertical sky component (VSC)	The amount of daylight falling on a vertical wall or window. It is the ratio of that part of illuminance, at a point on a given vertical plane (e.g. window), that is received directly from a CIE standard overcast sky, to simultaneous 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. The ratio is usually expressed as a percentage. The maximum value is almost 40% for a completely unobstructed vertical wall.
Working plane	Horizontal, vertical or inclined plane in which a visual task lies. Normally the working plane may be taken to be horizontal, 0.85 m above the floor in housing.

Appendix 2

Location drawings

Site location plan
Spot-height drawings
Window maps
Room location plans



NEIGHBOURING
PROPERTIES CONSIDERED
FOR ANALYSIS

- 1: Block E:
Dwg No: 21384-LOC-001
- 2: Block F:
Dwg No: 21384-LOC-002
- 3: Garrard House:
Dwg No: 21384-LOC-003
- 4: Projection West:
Dwg No: 21384-LOC-004
- 5: 125 Friar Street:
Dwg No: 21384-LOC-005

NO DIMENSIONS TO BE SCALED
FROM THIS DRAWING

KEY:	
	Existing
	Surrounding
	Neighbouring Property

SOURCE DATA:
Existing & Neighbouring Surrounding:

3D Services Ltd:
3D Model File Name: - 17-067 30-39 Friar Street,
Reading 3D Site.dwg

Surrounding Context:

Zmapping 3D Model

Station Hill Dev, Block E and F: - Planning
application drawing information

NOTES:
Relevant neighbouring properties
considered for analysis

REV	Description	Drawn	Date

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Chartered Surveyors

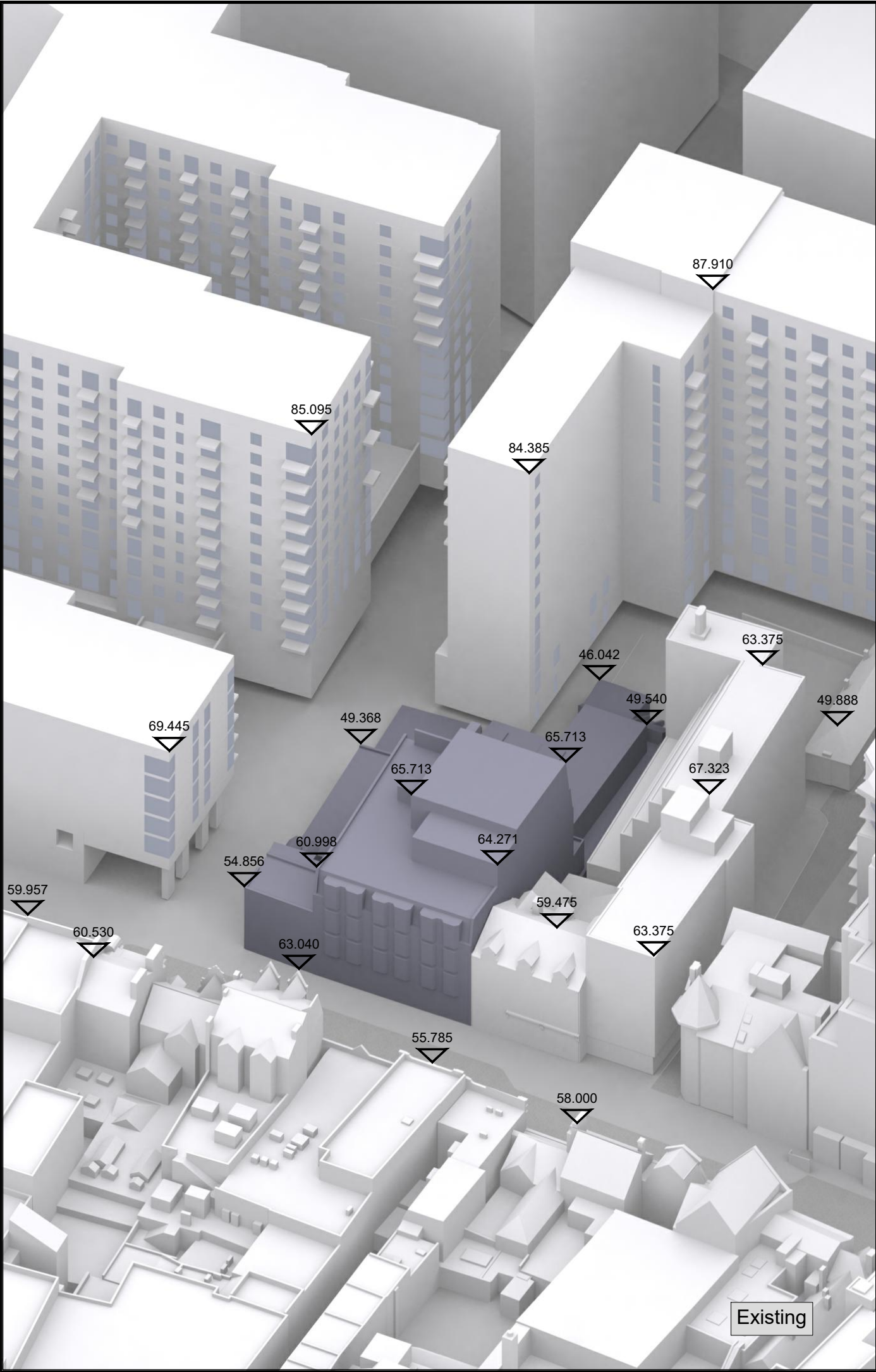
London 020 7936 3668
Liverpool 0151 242 0980
Bristol 0117 450 9703

www.delvapatmanredler.co.uk
info@delvapatmanredler.co.uk

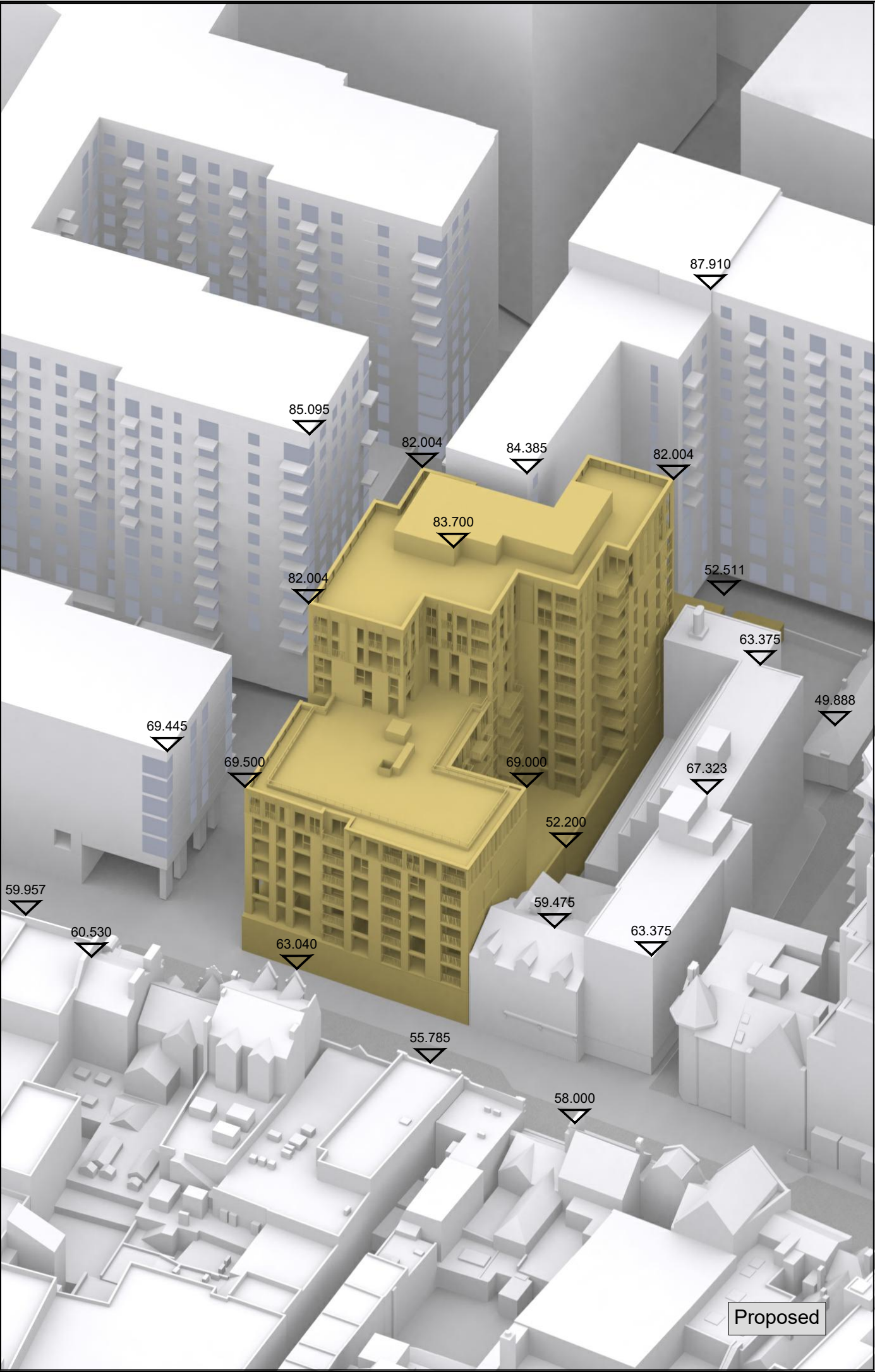
TITLE:
35-39 FRIAR STREET,
READING, RG1 DX.

DRAWING:
LOCATION PLAN
Daylight and Sunlight

DRAWN: VK		JOB NBR: 21384
SCALE: 1:750@A3		
DATE: 28/07/2021		
DWG NO: LOC_DS_001		REV: -



Existing



Proposed

NO DIMENSIONS TO BE SCALED FROM THIS DRAWING

KEY:

Existing

Surrounding

Proposed

SOURCE DATA:

Existing & Neighbouring Surrounding:

3D Services Ltd:
3D Model File Name: - 17-067 30-39 Friar Street, Reading 3D Site.dwg

Surrounding Context:

Zmapping 3D Model

Station Hill Dev, Block E and F: - Planning application drawing information

Proposed:

Stefan Shaw Studio (Architects):(info received 24.02.2022 and 12.05.2022)
3D Model File Name: - 220215_FRIAR ST_PROPOSED 3D MODEL.dwg
Set using reference points from pdf: - 220224_Friar Street_Spot coordinate 3d.pdf

NOTES:

All heights given in m AOD

3D View

REV	Description	Drawn	Date

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TITLE:

35-39 FRIAR STREET,
READING, RG1 DX.

DRAWING:

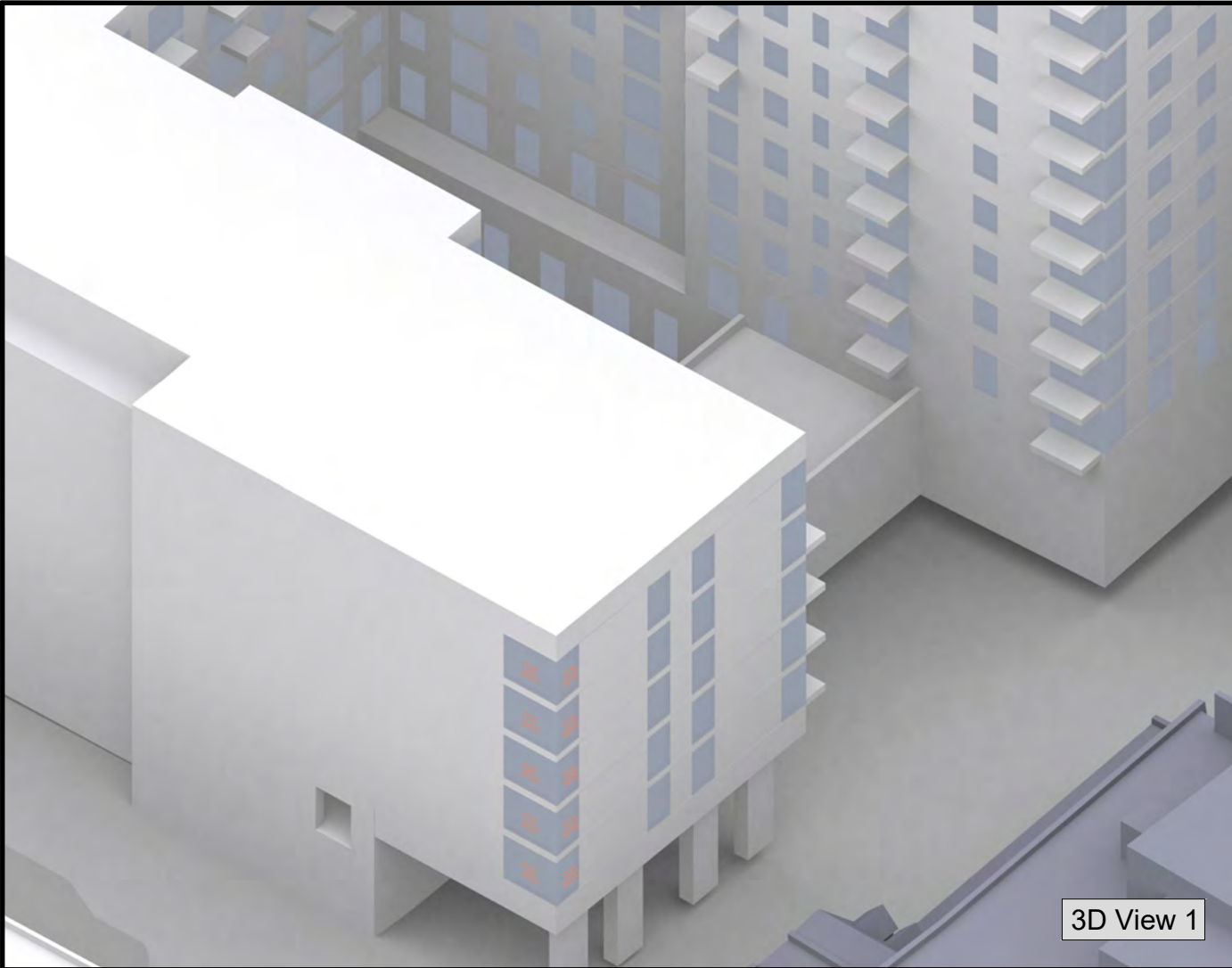
EXISTING & PROPOSED SCENARIOS
Plan and 3D Views

DRAWN: VK
SCALE: NTS
DATE: 07/03/2022

JOB NBR:
21384

DWG NO:
SPT_003

REV:
-



3D View 1



3D View 2



3D View 3



3D View 4

NO DIMENSIONS TO BE SCALED FROM THIS DRAWING

KEY:

Existing

Surrounding

Neighbouring Property

W1

W1

Windows tested Daylight only

Windows tested Daylight & Sunlight

SOURCE DATA:

Existing & Neighbouring Surrounding:

3D Services Ltd:
3D Model File Name: - 17-067 30-39 Friar Street, Reading 3D Site.dwg

Surrounding Context:

Zmapping 3D Model

Station Hill Dev. Block E and F: - Planning application drawing information

NOTES:

Layouts obtained from local authority website

REV	Description	Drawn	Date

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TITLE:

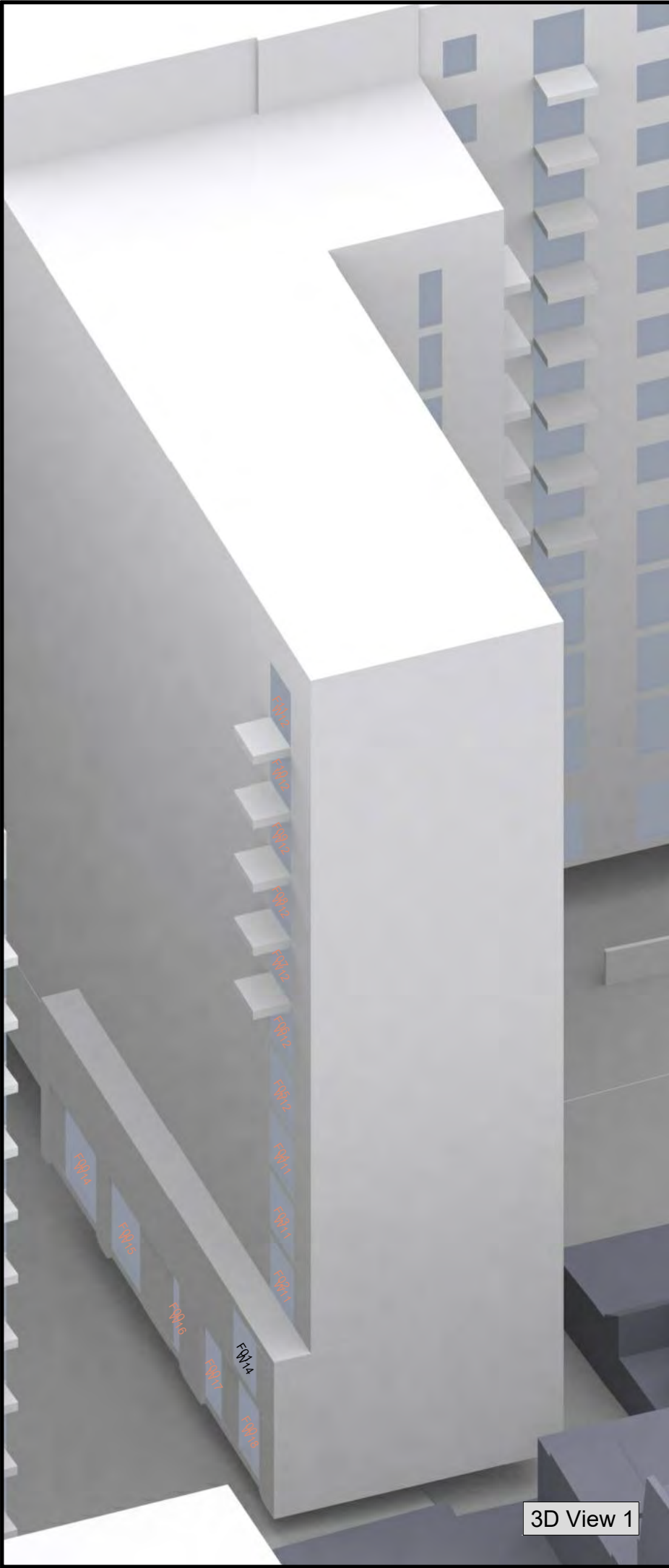
35-39 FRIAR STREET,
READING, RG1 DX.

DRAWING:

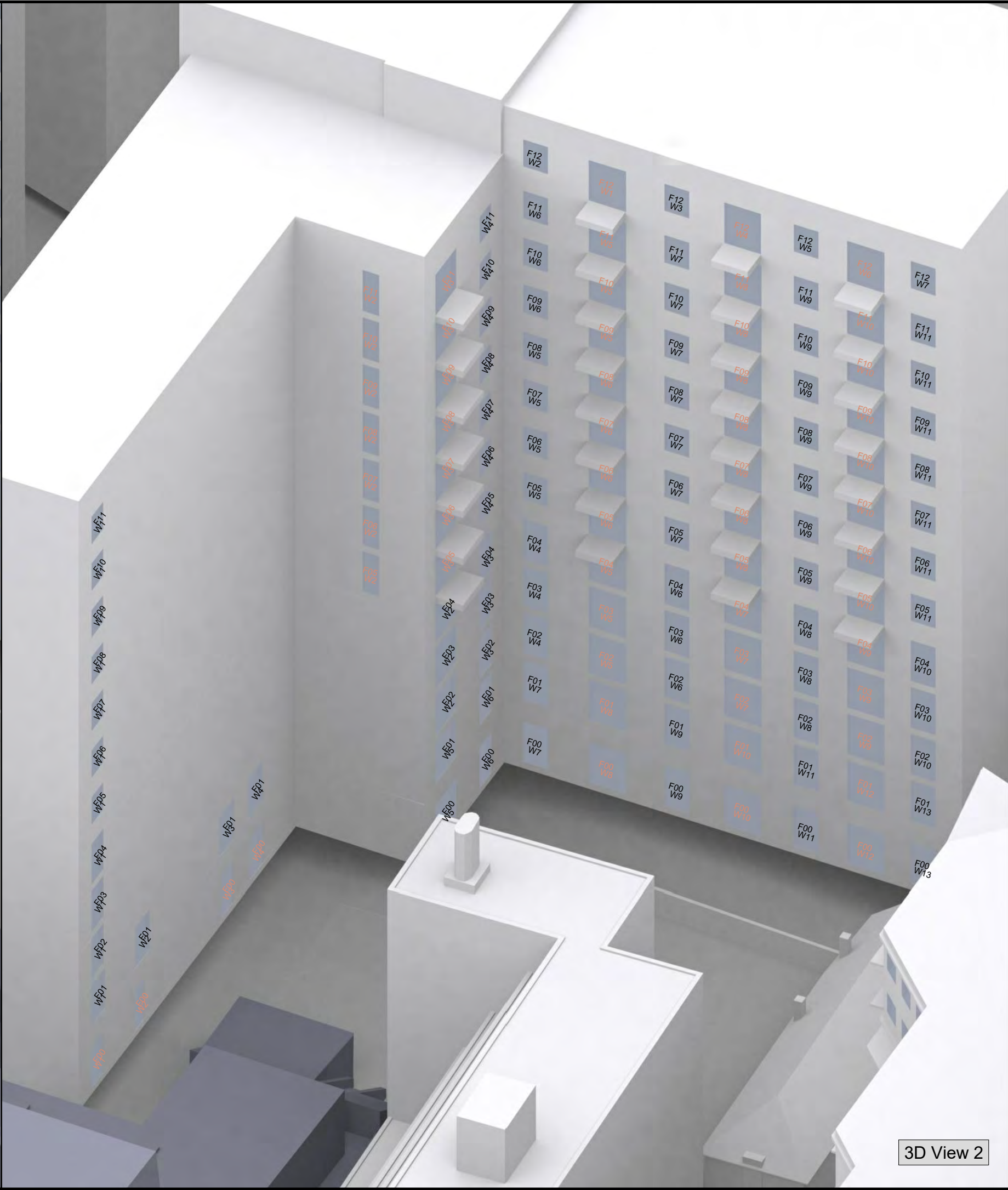
KEY WINDOW LOCATIONS
Plan and 3D Views

Block E

DRAWN: VK	JOB NBR:
SCALE: NTS	21384
DATE: 27/07/2021	
DWG NO:	REV:
LOC_001	-



3D View 1



3D View 2

NO DIMENSIONS TO BE SCALED FROM THIS DRAWING

KEY:

Existing

Surrounding

Neighbouring Property

W1

W1

Windows tested Daylight only

Windows tested Daylight & Sunlight

SOURCE DATA:

Existing & Neighbouring Surrounding:

3D Services Ltd:
3D Model File Name: - 17-067 30-39 Friar Street, Reading 3D Site.dwg

Surrounding Context:

Zmapping 3D Model

Station Hill Dev, Block E and F: - Planning application drawing information

NOTES:

Layouts obtained from local authority website

REV	Description	Drawn	Date

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TITLE:

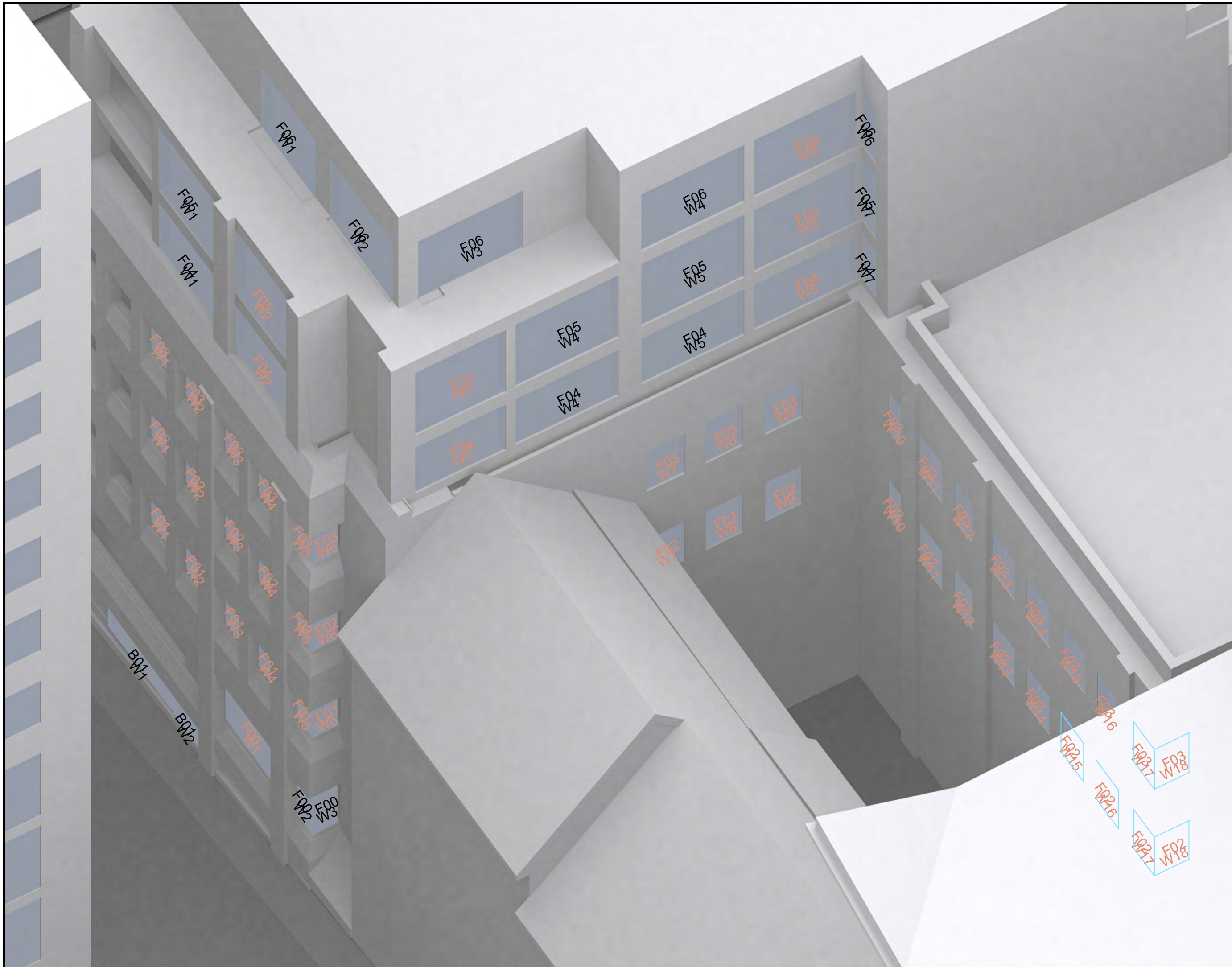
35-39 FRIAR STREET,
READING, RG1 DX.

DRAWING:

KEY WINDOW LOCATIONS
Plan and 3D Views

Block F

DRAWN: VK	JOB NBR:
SCALE: NTS	21384
DATE: 27/07/2021	
DWG NO:	REV:
LOC_002	-



NO DIMENSIONS TO BE SCALED
FROM THIS DRAWING

KEY:

	Existing	 W1	Windows tested Daylight only
	Surrounding		
	Neighbouring Property	 W1	Windows tested Daylight & Sunlight

SOURCE DATA:

Existing & Neighbouring Surrounding:

3D Services Ltd:
3D Model File Name: - 17-067 30-39 Friar Street,
Reading 3D Site.dwg

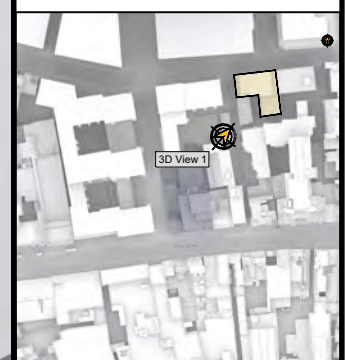
Surrounding Context:

Zmapping 3D Model

Station Hill Dev. Block E and F: - Planning application drawing information

NOTES:

Layouts obtained from local authority website



REV	Description	Drawn	Date

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Bristol 0117 450 9703

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TITLE:

35-39 FRIAR STREET,
READING, RG1 DX.

DRAWING:

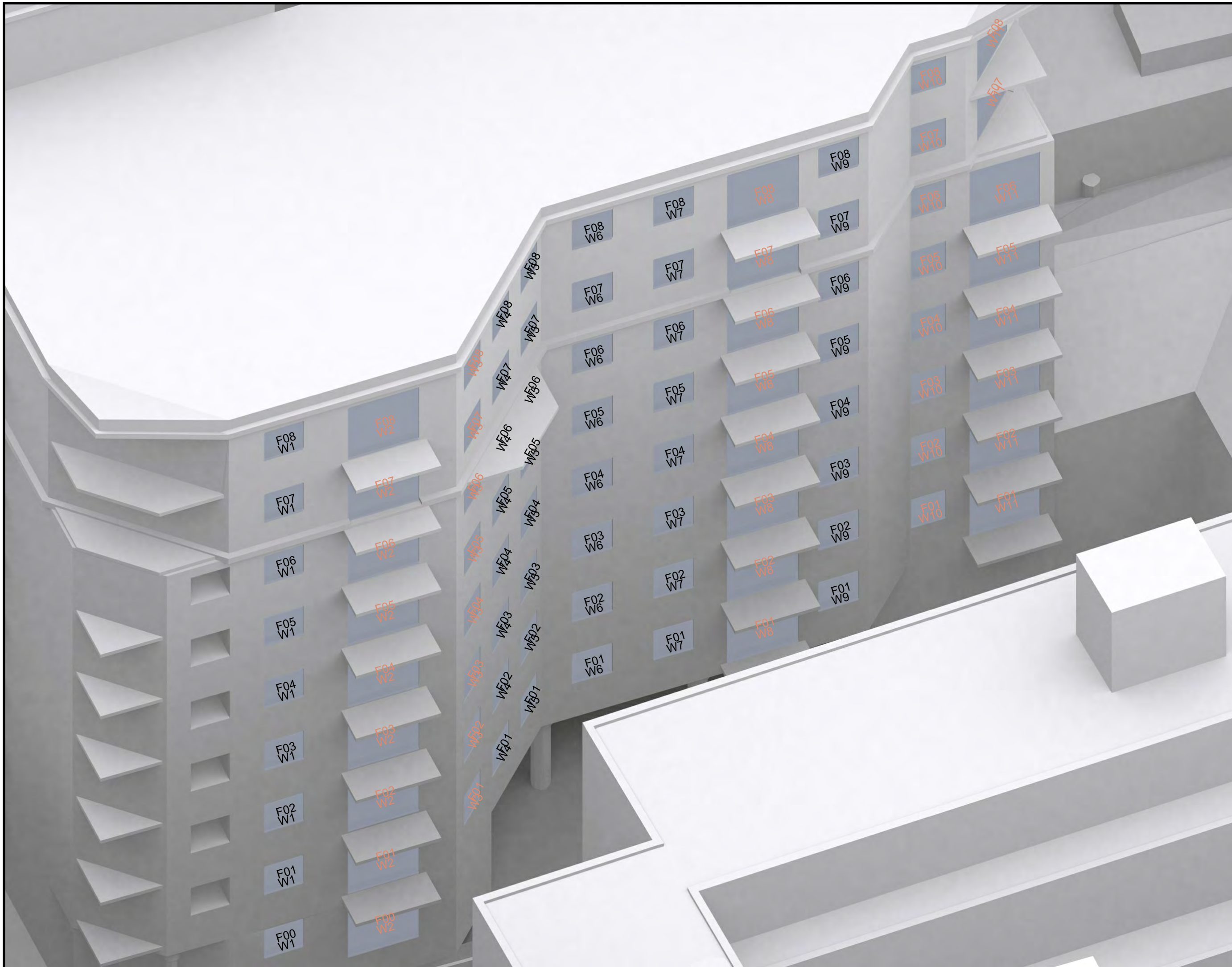
KEY WINDOW LOCATIONS

Plan and 3D Views

Garrard House

DRAWN: VK	JOB NBR: 21384
SCALE: NTS	
DATE: 27/07/2021	

DWG NO:	REV:
LOC_003	-



NO DIMENSIONS TO BE SCALED
FROM THIS DRAWING

KEY:

Existing
Surrounding
Neighbouring Property

W1 Windows tested Daylight only

W1 Windows tested Daylight & Sunlight

SOURCE DATA:

Existing & Neighbouring Surrounding:

3D Services Ltd:
3D Model File Name: - 17-067 30-39 Friar Street,
Reading 3D Site.dwg

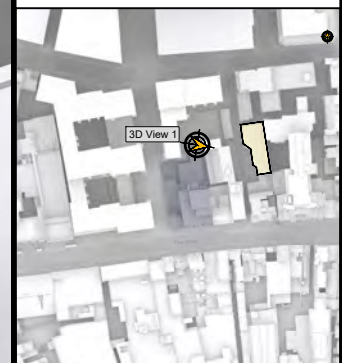
Surrounding Context:

Zmapping 3D Model

Station Hill Dev. Block E and F: - Planning application drawing information

NOTES:

Layouts obtained from estate agents
online plans.



REV	Description	Drawn	Date

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Bristol 0117 450 9703

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TITLE:

35-39 FRIAR STREET,
READING, RG1 DX.

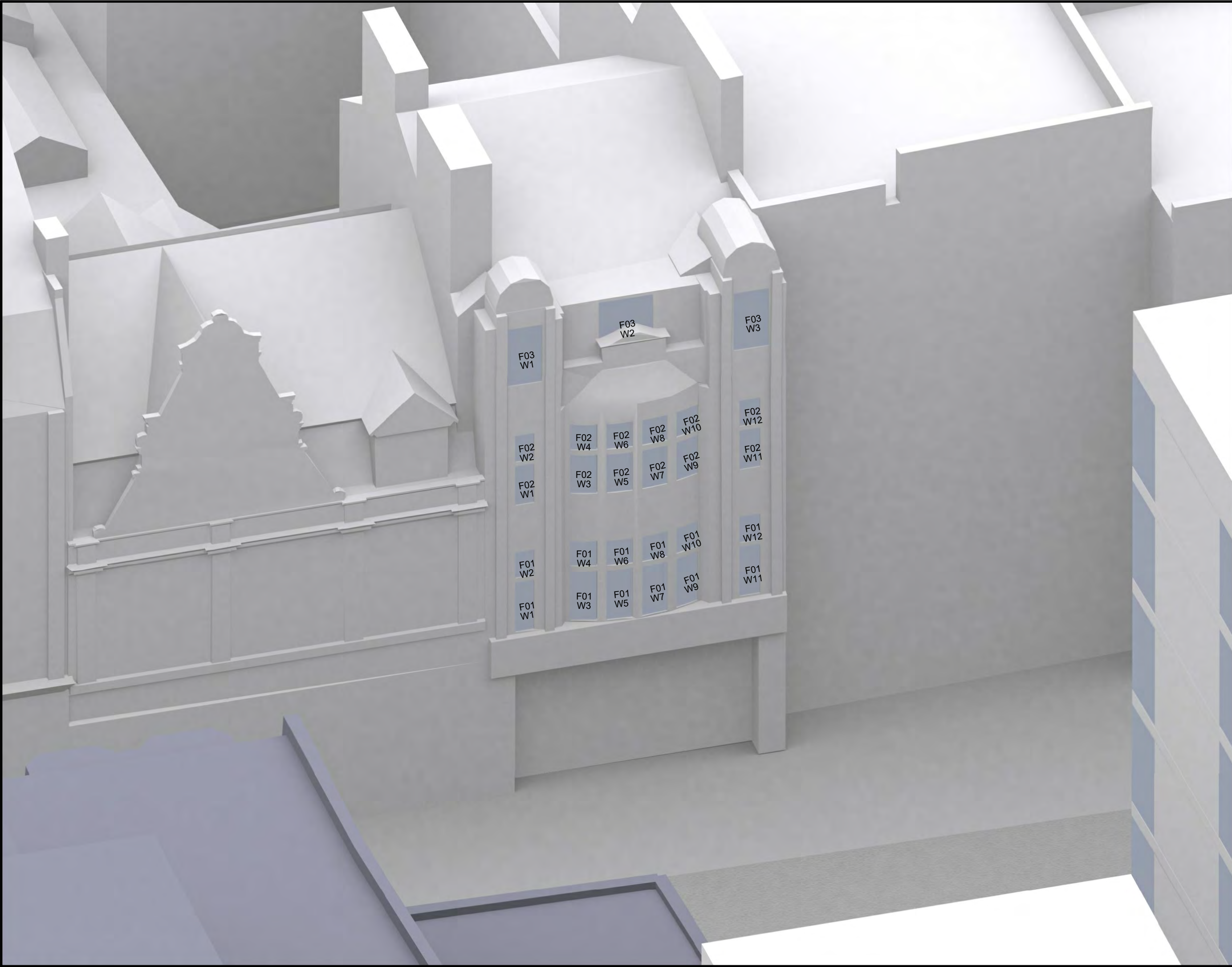
DRAWING:

KEY WINDOW LOCATIONS

Plan and 3D Views

Projection West

DRAWN: VK	JOB NBR: 21384
SCALE: NTS	
DATE: 27/07/2021	
DWG NO: LOC 004	REV: -



NO DIMENSIONS TO BE SCALED FROM THIS DRAWING

KEY:

Existing

Surrounding

Neighbouring Property

W1

Windows tested Daylight only

W1

Windows tested Daylight & Sunlight

SOURCE DATA:

Existing & Neighbouring Surrounding:

3D Services Ltd:
3D Model File Name: - 17-067 30-39 Friar Street, Reading 3D Site.dwg

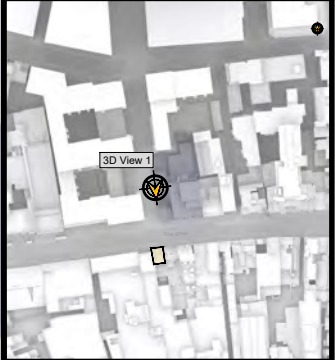
Surrounding Context:

Zmapping 3D Model

Station Hill Dev, Block E and F: - Planning application drawing information

NOTES:

Layouts obtained from local authority website



REV	Description	Drawn	Date

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Bristol 0117 456 9703
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info@delvapatmanredler.co.uk

TITLE:

35-39 FRIAR STREET,
READING, RG1 DX.

DRAWING:

KEY WINDOW LOCATIONS
Plan and 3D Views

125 Friar Street

DRAWN: VK	JOB NBR:
SCALE: NTS	21384
DATE: 27/07/2021	
DWG NO:	REV:
LOC_005	-

Appendix 3

Daylight and sunlight results for proposed dwellings



This detailed floor plan illustrates the layout of a residential building, featuring 34 rooms and 42 windows. The rooms are labeled as follows:

- Bedrooms:** R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32, R33, R34.
- Living Dining (LD):** R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32, R33, R34.
- Living Kitchen Dining (LKD):** R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32, R33, R34.

The windows are labeled W1 through W42, distributed throughout the building's perimeter and internal corridors. The plan also shows various architectural features such as stairwells, hallways, and room partitions.

EV:

Property & room attributes					Daylight (BRE)					Sunlight (BRE)	
Floor	Flat no.	Room ref.	Property type	Room use	ADF		NSL (% room)	Room depth criterion		APSH room	
					Target (%)	ADF (%)		Limit (current) (m)	Criterio n met?	Annual (%)	Winter (%)
Proposed Scheme											
F01		R1	Commercial	Bedroom	1.0	0.54	46%	8.22	Yes	2	1
		R2	Residential	LD	1.5	1.48	43%	Exempt: Dual Aspect	Yes	8	4
		R3	Residential	Bedroom	1.0	0.97	23%	7.49	Yes	5	2
		R4	Residential	Bedroom	1.0	0.51	38%	8.22	Yes	1	1
		R5	Residential	LD	1.5	5.14	98%	Exempt: Dual Aspect	Yes	64	19
		R6	Residential	Bedroom	1.0	2.78	97%	9.40	Yes	51	16
		R7	Residential	Bedroom	1.0	1.92	99%	9.06	Yes	14	12
		R8	Residential	LD	1.5	2.57	92%	Exempt: Dual Aspect	Yes	50	18
		R9	Residential	Bedroom	1.0	1.24	93%	8.56	Yes	7	5
		R10	Residential	LD	1.5	1.80	92%	Exempt: Dual Aspect	Yes	48	18
		R11	Residential	LD	1.5	1.25	94%	8.88	Yes	10	10
		R12	Residential	Bedroom	1.0	2.39	81%	9.58	Yes	0	0
		R13	Residential	Bedroom	1.0	1.38	53%	8.42	Yes	0	0
		R14	Residential	LKD	1.5	0.79	40%	Exempt: Dual Aspect	Yes	0	0
		R15	Residential	LD	1.5	0.80	37%	9.23	Yes	2	0
		R16	Residential	Bedroom	1.0	1.60	61%	8.22	Yes	4	0
		R17	Residential	Bedroom	1.0	1.54	62%	8.01	Yes	7	0
		R18	Residential	LD	1.5	0.68	30%	9.07	Yes	2	0
		R19	Residential	Bedroom	1.0	0.84	42%	8.29	Yes	5	0
		R20	Residential	Bedroom	1.0	1.86	76%	Exempt: Dual Aspect	Yes	24	4
		R21	Residential	LKD	1.5	1.29	61%	Exempt: Dual Aspect	Yes	6	4
		R22	Residential	LKD	1.5	1.18	57%	Exempt: Dual Aspect	Yes	7	5
		R23	Residential	Bedroom	1.0	0.78	33%	Exempt: Dual Aspect	Yes	0	0
		R24	Residential	LD	1.5	1.25	42%	Exempt: Dual Aspect	Yes	0	0
		R25	Residential	Bedroom	1.0	0.91	19%	7.13	Yes	0	0
F02		R1	Residential	Bedroom	1.0	0.65	73%	8.23	Yes	1	0
		R2	Residential	LKD	1.5	1.85	90%	Exempt: Dual Aspect	Yes	11	0
		R3	Residential	Bedroom	1.0	0.38	57%	8.36	Yes	1	0
		R4	Residential	LD	1.5	1.92	83%	8.90	Yes	19	0
		R5	Residential	Bedroom	1.0	1.35	93%	7.93	Yes	13	0
		R6	Residential	Bedroom	1.0	0.71	50%	Exempt: Dual Aspect	Yes	0	0
		R7	Residential	LD	1.5	1.82	75%	9.09	Yes	10	0
		R8	Residential	Bedroom	1.0	1.19	61%	7.93	Yes	4	0
		R9	Residential	Bedroom	1.0	0.75	44%	Exempt: Dual Aspect	Yes	2	1
		R10	Residential	LD	1.5	1.59	41%	9.09	Yes	9	4
		R11	Residential	Bedroom	1.0	1.11	27%	7.93	Yes	4	2
		R12	Residential	Bedroom	1.0	0.53	38%	8.40	Yes	2	2
		R13	Residential	LKD	1.5	5.66	98%	Exempt: Dual Aspect	Yes	72	27
		R14	Residential	Bedroom	1.0	3.05	97%	9.40	Yes	55	20
		R15	Residential	Bedroom	1.0	2.32	99%	9.05	Yes	17	17
		R16	Residential	LD	1.5	2.77	99%	Exempt: Dual Aspect	Yes	56	24
		R18	Residential	Bedroom	1.0	1.47	96%	8.56	Yes	7	7
		R19	Residential	LD	1.5	1.83	96%	9.54	Yes	50	20
		R20	Residential	LD	1.5	1.45	97%	8.88	Yes	10	10
		R21	Residential	Bedroom	1.0	2.61	83%	9.58	Yes	0	0

Orange or Red = Below guidelines (Orange = within 20% of guideline or LKD/LK/KD/Studio>1.5% ADF)

Grey APSH = not a main living room

Property & room attributes					Daylight (BRE)					Sunlight (BRE)	
Floor	Flat no.	Room ref.	Property type	Room use	ADF		NSL (% room)	Room depth criterion		APSH room	
					Target (%)	ADF (%)		Limit (current) (m)	Criterion met?	Annual (%)	Winter (%)
		R22	Residential	Bedroom	1.0	1.48	52%	8.42	Yes	0	0
		R23	Residential	LKD	1.5	1.49	71%	Exempt: Dual Aspect	Yes	5	0
		R24	Residential	LD	1.5	1.12	55%	9.23	Yes	3	0
		R25	Residential	Bedroom	1.0	1.75	68%	8.22	Yes	6	0
		R26	Residential	Bedroom	1.0	1.69	69%	8.01	Yes	9	0
		R27	Residential	LD	1.5	0.99	50%	9.07	Yes	3	0
		R28	Residential	Bedroom	1.0	0.91	47%	8.29	Yes	5	0
		R29	Residential	Bedroom	1.0	2.08	79%	Exempt: Dual Aspect	Yes	27	4
		R30	Residential	LKD	1.5	1.54	74%	Exempt: Dual Aspect	Yes	12	6
		R31	Residential	LKD	1.5	1.50	60%	Exempt: Dual Aspect	Yes	11	7
		R32	Residential	Bedroom	1.0	0.88	34%	Exempt: Dual Aspect	Yes	0	0
		R33	Residential	LD	1.5	1.35	45%	Exempt: Dual Aspect	Yes	0	0
		R34	Residential	Bedroom	1.0	1.00	22%	7.27	Yes	0	0
F03		R1	Residential	Bedroom	1.0	0.78	76%	8.23	Yes	2	1
		R2	Residential	LKD	1.5	1.97	88%	Exempt: Dual Aspect	Yes	6	1
		R3	Residential	Bedroom	1.0	0.62	92%	8.36	Yes	2	1
		R4	Residential	LD	1.5	2.09	100%	8.90	Yes	15	0
		R5	Residential	Bedroom	1.0	1.48	96%	7.93	Yes	16	0
		R6	Residential	Bedroom	1.0	0.78	77%	Exempt: Dual Aspect	Yes	1	0
		R7	Residential	LD	1.5	2.02	89%	9.09	Yes	15	0
		R8	Residential	Bedroom	1.0	1.36	67%	7.93	Yes	8	0
		R9	Residential	Bedroom	1.0	0.79	55%	Exempt: Dual Aspect	Yes	3	1
		R10	Residential	LD	1.5	1.82	44%	9.09	Yes	11	4
		R11	Residential	Bedroom	1.0	1.27	29%	7.93	Yes	6	2
		R12	Residential	Bedroom	1.0	0.63	35%	8.40	Yes	2	2
		R13	Residential	LKD	1.5	6.15	98%	Exempt: Dual Aspect	Yes	73	28
		R14	Residential	Bedroom	1.0	3.30	97%	9.40	Yes	50	19
		R15	Residential	Bedroom	1.0	2.64	99%	9.05	Yes	14	14
		R16	Residential	LD	1.5	2.97	99%	Exempt: Dual Aspect	Yes	59	27
		R17	Residential	Bedroom	1.0	1.71	99%	8.56	Yes	6	6
		R18	Residential	LD	1.5	1.93	98%	9.54	Yes	53	23
		R19	Residential	LD	1.5	1.55	98%	8.88	Yes	8	8
		R20	Residential	Bedroom	1.0	2.83	86%	9.58	Yes	0	0
		R21	Residential	Bedroom	1.0	1.58	54%	8.42	Yes	0	0
		R22	Residential	LKD	1.5	1.63	82%	Exempt: Dual Aspect	Yes	6	0
		R23	Residential	LD	1.5	1.31	67%	9.23	Yes	5	1
		R24	Residential	Bedroom	1.0	1.86	75%	8.22	Yes	9	1
		R25	Residential	Bedroom	1.0	1.80	76%	8.01	Yes	10	1
		R26	Residential	LD	1.5	1.17	62%	9.07	Yes	4	1
		R27	Residential	Bedroom	1.0	0.97	52%	8.29	Yes	7	1
		R28	Residential	Bedroom	1.0	2.31	86%	Exempt: Dual Aspect	Yes	32	7
		R29	Residential	LKD	1.5	1.74	80%	Exempt: Dual Aspect	Yes	14	5
		R30	Residential	LKD	1.5	1.87	71%	Exempt: Dual Aspect	Yes	15	5
		R31	Residential	Bedroom	1.0	0.49	35%	Exempt: Dual Aspect	Yes	0	0
		R32	Residential	LD	1.5	1.48	49%	Exempt: Dual Aspect	Yes	0	0
		R33	Residential	Bedroom	1.0	1.11	23%	7.27	Yes	0	0
F04		R1	Residential	Bedroom	1.0	0.91	78%	8.23	Yes	3	2

Orange or Red = Below guidelines (Orange = within 20% of guideline or LKD/LK/KD/Studio>1.5% ADF)

Grey APSH = not a main living room

Property & room attributes					Daylight (BRE)					Sunlight (BRE)	
Floor	Flat no.	Room ref.	Property type	Room use	ADF		NSL (% room)	Room depth criterion		APSH room	
					Target (%)	ADF (%)		Limit (current) (m)	Criterio n met?	Annual (%)	Winter (%)
		R2	Residential	LKD	1.5	2.10	89%	Exempt: Dual Aspect	Yes	6	1
		R3	Residential	Bedroom	1.0	0.77	94%	8.36	Yes	2	1
		R4	Residential	LD	1.5	2.29	100%	8.90	Yes	18	3
		R5	Residential	Bedroom	1.0	1.62	98%	7.93	Yes	17	0
		R6	Residential	Bedroom	1.0	0.85	84%	Exempt: Dual Aspect	Yes	2	0
		R7	Residential	LD	1.5	2.26	96%	9.09	Yes	19	2
		R8	Residential	Bedroom	1.0	1.55	75%	7.93	Yes	14	0
		R9	Residential	Bedroom	1.0	0.85	69%	Exempt: Dual Aspect	Yes	4	1
		R10	Residential	LD	1.5	2.10	50%	9.09	Yes	13	4
		R11	Residential	Bedroom	1.0	1.47	37%	7.93	Yes	10	2
		R12	Residential	Bedroom	1.0	0.66	35%	8.40	Yes	2	2
		R13	Residential	LKD	1.5	6.58	98%	Exempt: Dual Aspect	Yes	73	28
		R14	Residential	Bedroom	1.0	3.46	97%	9.40	Yes	50	19
		R15	Residential	Bedroom	1.0	2.85	99%	9.05	Yes	14	14
		R16	Residential	LD	1.5	3.10	99%	Exempt: Dual Aspect	Yes	59	27
		R17	Residential	Bedroom	1.0	1.88	99%	8.56	Yes	6	6
		R18	Residential	LD	1.5	2.01	98%	9.54	Yes	54	24
		R19	Residential	LD	1.5	1.62	98%	8.88	Yes	8	8
		R20	Residential	Bedroom	1.0	3.03	89%	9.58	Yes	0	0
		R21	Residential	Bedroom	1.0	1.69	58%	8.42	Yes	0	0
		R22	Residential	LKD	1.5	1.75	85%	Exempt: Dual Aspect	Yes	6	0
		R23	Residential	LKD	1.5	1.46	77%	9.23	Yes	7	2
		R24	Residential	Bedroom	1.0	1.95	84%	8.22	Yes	10	2
		R25	Residential	Bedroom	1.0	1.89	84%	8.01	Yes	13	2
		R26	Residential	LD	1.5	1.30	70%	9.07	Yes	6	3
		R27	Residential	Bedroom	1.0	1.02	58%	8.29	Yes	8	2
		R28	Residential	Bedroom	1.0	2.53	89%	Exempt: Dual Aspect	Yes	35	9
		R29	Residential	LKD	1.5	1.84	82%	Exempt: Dual Aspect	Yes	16	6
		R30	Residential	LKD	1.5	1.96	91%	Exempt: Dual Aspect	Yes	16	5
		R31	Residential	Bedroom	1.0	1.57	64%	Exempt: Dual Aspect	Yes	0	0
		R32	Residential	LD	1.5	1.62	57%	Exempt: Dual Aspect	Yes	0	0
		R33	Residential	Bedroom	1.0	1.23	27%	7.27	Yes	0	0

Appendix 4

Daylight and sunlight results for neighbouring buildings

Property, room & window attributes				VSC				NSL				APSH (room)							
Floor	Room	Room use	Window Ref./Orientation	Exis. (%) VSC	Prop. (%) VSC	Loss (%) VSC	Pro./Ex. ratio	Exis. (%) rm	Prop. (%) rm	Loss (m²)	Pro./Ex. ratio	Annual (%APSH)				Winter (%APSH)			
												Exis.	Prop.	Loss	Pro./Ex.	Exis.	Prop.	Pro./Ex.	
Block E																			
F00	R1	LKD	W1 →	0.0	0.0	0.0	N/A												
		LKD	W2 ↑	3.6	3.6	0.0	1.00	3%	3%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R2	Bedroom	W3 ↑	5.3	4.9	0.4	0.93	11%	10%	0.04	0.96	North	North	N/A	N/A	North	North	N/A	
	R3	Bedroom	W4 ↑	5.3	4.7	0.6	0.88	9%	9%	0.03	0.96	North	North	N/A	N/A	North	North	N/A	
	R4	LKD	W5 ↑	5.1	4.4	0.7	0.87	5%	5%	0.01	0.99	North	North	N/A	N/A	North	North	N/A	
	R5	LKD	W6 ↑	2.8	2.8	0.0	1.00	7%	7%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R6	Bedroom	W7 ↑	3.6	3.1	0.4	0.88	4%	4%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R7	Bedroom	W8 →	8.2	5.8	2.4	0.71	68%	43%	2.65	0.63	North	North	N/A	N/A	North	North	N/A	
	R8	LKD	W9 →	9.6	6.7	2.9	0.70	81%	29%	13.96	0.36	North	North	N/A	N/A	North	North	N/A	
	R9	LKD	W10 →	10.7	7.8	2.9	0.73	89%	38%	13.68	0.43	North	North	N/A	N/A	North	North	N/A	
	R10	Bedroom	W11 →	11.0	8.2	2.8	0.74	75%	60%	1.58	0.81	North	North	N/A	N/A	North	North	N/A	
	R11	LKD	W12 →	10.6	8.0	2.6	0.76	66%	36%	10.10	0.55	North	North	N/A	N/A	North	North	N/A	
	R12	LKD	W13 ↓	8.0	7.2	0.8	0.90	14%	13%	0.20	0.95	12	12	0	1.00	0	0	N/A	
	R13	Bedroom	W14 ↓	9.3	8.2	1.0	0.89	27%	27%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R14	Bedroom	W15 ↓	10.1	9.0	1.2	0.89	26%	26%	0.03	0.99	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R15	LKD	W16 ↓	10.6	9.6	1.0	0.91	15%	15%	0.10	0.97	21	20	1	0.95	0	0	N/A	
	R16	Bedroom	W17 ↓	10.2	9.9	0.3	0.97	28%	28%	0.03	0.99	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R17	LKD	W18 →	5.9	5.9	0.0	1.00	25%	25%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R18	Bedroom	W19 →	5.4	5.4	0.0	1.00	44%	44%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R19	Bedroom	W20 ↓	3.3	3.3	0.0	1.00	7%	7%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R20	LKD	W21 ↓	3.6	3.6	0.0	1.00	5%	5%	0.00	1.00	1	1	0	1.00	0	0	N/A	
	R21	Bedroom	W22 ↓	4.1	4.1	0.0	1.00	8%	8%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R22	LKD	W23 ↓	4.3	4.3	0.0	1.00	6%	6%	0.00	1.00	0	0	0	N/A	0	0	N/A	
	R23	Bedroom	W24 ↓	4.5	4.5	0.0	1.00	11%	11%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R24	LKD	W25 ↓	4.1	4.1	0.0	1.00	8%	8%	0.00	1.00	2	2	0	1.00	0	0	N/A	
	R25	Bedroom	W26 ↓	2.8	2.8	0.0	1.00	8%	8%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
F01	R1	Bedroom	W1 ↑	10.2	7.7	2.5	0.76	28%	27%	0.14	0.95	North	North	N/A	N/A	North	North	N/A	
	R2	LKD	W2 ↑	9.1	7.0	2.1	0.77	16%	15%	0.22	0.95	North	North	N/A	N/A	North	North	N/A	
	R3	Bedroom	W3 ↑	6.9	5.2	1.7	0.75	20%	19%	0.18	0.92	North	North	N/A	N/A	North	North	N/A	
	R4	LKD	W4 →	11.3	5.8	5.5	0.51												
		LKD	W5 ↑	7.9	6.6	1.3	0.83	31%	16%	2.90	0.52	North	North	N/A	N/A	North	North	N/A	
	R5	Bedroom	W6 ↑	7.4	6.4	1.0	0.86	14%	14%	0.02	0.99	North	North	N/A	N/A	North	North	N/A	
	R6	Bedroom	W7 ↑	7.0	6.1	0.9	0.87	12%	12%	0.01	0.99	North	North	N/A	N/A	North	North	N/A	
	R7	LKD	W8 ↑	6.5	5.8	0.7	0.89	7%	7%	0.01	1.00	North	North	N/A	N/A	North	North	N/A	
	R8	LKD	W9 ↑	3.8	3.8	0.0	1.00	10%	10%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R9	Bedroom	W10 ↑	4.2	3.8	0.4	0.90	8%	8%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R10	Bedroom	W11 →	8.9	6.7	2.2	0.75	72%	55%	1.84	0.77	North	North	N/A	N/A	North	North	N/A	
	R11	LKD	W12 →	10.6	8.0	2.6	0.75	87%	37%	13.64	0.42	North	North	N/A	N/A	North	North	N/A	
	R12	LKD	W13 →	12.1	9.5	2.6	0.78	94%	46%	13.20	0.49	North	North	N/A	N/A	North	North	N/A	
	R13	Bedroom	W14 →	12.6	9.9	2.7	0.79	76%	67%	1.14	0.88	North	North	N/A	N/A	North	North	N/A	
	R14	LKD	W15 →	12.0	9.6	2.4	0.80	81%	43%	11.00	0.53	North	North	N/A	N/A	North	North	N/A	
	R15	Bedroom	W16 →	10.8	8.7	2.1	0.80	72%	61%	1.35	0.85	North	North	N/A	N/A	North	North	N/A	
	R16	Bedroom	W17 ↓	9.1	8.4	0.7	0.92	36%	36%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R17	LKD	W18 ↓	11.4	10.5	0.9	0.92	21%	21%	0.03	0.99	22	22	0	1.00	0	0	N/A	
	R18	Bedroom	W19 ↓	13.1	12.0	1.0	0.92	41%	41%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R19	Bedroom	W20 ↓	14.1	13.0	1.1	0.92	44%	44%	0.01	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R20	LKD	W21 ↓	14.0	13.3	0.7	0.95	23%	23%	0.00	1.00	29	29	N/A	N/A	0	0	N/A	
	R21	Bedroom	W22 ↓	9.9	9.9	0.0	1.00	42%	42%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R22	LKD	W23 ↓	16.1	13.8	2.3	0.86	23%	23%	0.06	0.99	28	28	N/A	N/A	0	0	N/A	
	R23	Bedroom	W24 ↓	16.8	14.0	2.8	0.83	43%	42%	0.03	0.99	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R24	LKD	W25 →	6.9	6.9	0.0	1.00	30%	30%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R25	Bedroom	W26 →	6.2	6.2	0.0	1.00	55%	55%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R26	Bedroom	W27 ↓	4.0	4.0	0.0	1.00	10%	10%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R27	LKD	W28 ↓	4.4	4.4	0.0	1.00	7%	7%	0.00	1.00	5	5	0	1.00	0	0	N/A	
	R28	Bedroom	W29 ↓	5.0	5.0	0.0	1.00	11%	11%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R29	LKD	W30 ↓	5.3	5.3	0.0	1.00	7%	7%	0.00	1.00	5	5	0	1.00	0	0	N/A	
	R30	Bedroom	W31 ↓	5.7	5.7	0.0	1.00	13%	13%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R31	LKD	W32 ↓	5.4	5.4	0.0	1.00	9%	9%	0.00	1.00	6	6	0	1.00	0	0	N/A	
	R32	Bedroom	W33 ↓	3.7	3.7	0.0	1.00	11%	11%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R33	Bedroom	W34 ↓	6.2	6.0	0.2	0.96	13%	7%	0.66	0.55	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R34	LKD	W35 ↓	6.6	6.2	0.5	0.93	13%	5%	2.09	0.40	5	4	1	0.80	1	0	N/A*	

Property, room & window attributes				VSC				NSL				APSH (room)							
Floor	Room	Room use	Window Ref./Orientation	Exis. (% VSC)	Prop. (% VSC)	Loss (% VSC)	Pro./Ex. ratio	Exis. (% rm)	Prop. (% rm)	Loss (m²)	Pro./Ex. ratio	Annual (%APSH)				Winter (%APSH)			
	R35	Bedroom	W36 ↓	7.5	6.6	0.9	0.88	22%	10%	1.28	0.46	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R36	Bedroom	W37 ↓	9.2	7.3	1.9	0.79	46%	14%	3.50	0.30	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R37	LKD	W38 ↓	11.4	9.0	2.4	0.79												
		LKD	W39 →	6.0	5.3	0.7	0.89												
		LKD	W40 →	6.2	5.7	0.5	0.91	75%	60%	3.55	0.80	20	15	5	0.75	6	2	0.33	
	R38	Bedroom	W41 →	6.7	6.2	0.4	0.93	21%	21%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	N/A
F02	R1	Bedroom	W1 ↑	11.6	9.3	2.3	0.80	31%	30%	0.08	0.97	North	North	N/A	N/A	North	North	N/A	N/A
	R2	LKD	W2 ↑	10.4	8.5	1.9	0.82	17%	17%	0.06	0.99	North	North	N/A	N/A	North	North	N/A	N/A
	R3	Bedroom	W3 ↑	7.9	6.3	1.6	0.80	24%	23%	0.13	0.95	North	North	N/A	N/A	North	North	N/A	N/A
	R4	LKD	W4 →	12.3	6.9	5.4	0.56												
		LKD	W5 ↑	9.2	8.0	1.3	0.86	31%	19%	2.41	0.61	North	North	N/A	N/A	North	North	N/A	N/A
	R5	Bedroom	W6 ↑	8.8	7.8	1.0	0.89	18%	18%	0.01	0.99	North	North	N/A	N/A	North	North	N/A	N/A
	R6	Bedroom	W7 ↑	8.3	7.5	0.8	0.90	16%	16%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	N/A
	R7	LKD	W8 ↑	7.8	7.1	0.7	0.91	8%	8%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	N/A
	R8	LKD	W9 ↑	4.9	4.9	0.0	1.00	12%	12%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	N/A
	R9	Bedroom	W10 ↑	5.0	4.6	0.4	0.92	10%	10%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	N/A
	R10	Bedroom	W11 →	9.5	7.5	2.0	0.79	73%	66%	1.10	0.91	North	North	N/A	N/A	North	North	N/A	N/A
	R11	LKD	W12 →	11.2	8.8	2.4	0.79	92%	46%	12.73	0.50	North	North	N/A	N/A	North	North	N/A	N/A
	R12	LKD	W13 →	12.9	10.5	2.4	0.81	97%	51%	11.78	0.52	North	North	N/A	N/A	North	North	N/A	N/A
	R13	Bedroom	W14 →	14.3	11.7	2.6	0.82	78%	70%	0.75	0.90	North	North	N/A	N/A	North	North	N/A	N/A
	R14	LKD	W15 →	12.7	10.3	2.4	0.81	85%	49%	10.52	0.57	North	North	N/A	N/A	North	North	N/A	N/A
	R15	Bedroom	W16 →	11.7	9.6	2.1	0.82	72%	63%	0.82	0.88	North	North	N/A	N/A	North	North	N/A	N/A
	R16	Bedroom	W17 ↓	11.1	10.4	0.7	0.94	49%	49%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R17	LKD	W18 ↓	13.8	13.0	0.8	0.94	28%	28%	0.01	1.00	26	26	N/A	N/A	0	0	N/A	N/A
	R18	Bedroom	W19 ↓	16.3	15.3	1.0	0.94	57%	57%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R19	Bedroom	W20 ↓	17.5	16.5	1.0	0.94	59%	59%	0.01	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R20	LKD	W21 ↓	17.1	16.4	0.7	0.96	30%	30%	0.00	1.00	35	35	N/A	N/A	2	2	1.00	1.00
	R21	Bedroom	W22 ↓	12.8	12.8	0.0	1.00	57%	57%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R22	LKD	W23 ↓	19.4	17.1	2.3	0.88	31%	30%	0.03	0.99	35	35	N/A	N/A	1	1	1.00	1.00
	R23	Bedroom	W24 ↓	20.5	17.7	2.8	0.86	57%	57%	0.02	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R24	Studio	W25 ↓	20.4	17.4	3.0	0.85												
		Studio	W26 ↓	8.9	4.8	4.1	0.54	60%	43%	5.90	0.71	27	18	9	0.67	4	1	0.25	0.25
	R25	Bedroom	W27 ↓	23.3	17.3	6.0	0.74	76%	71%	0.48	0.94	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R26	LKD	W28 ↓	12.0	6.3	5.7	0.52												
		LKD	W29 →	20.0	5.1	14.9	0.26												
		LKD	W30 →	18.2	5.5	12.7	0.30	100%	70%	7.03	0.70	36	9	27	0.25	11	6	N/A	N/A
	R27	Bedroom	W31 →	15.7	5.5	10.2	0.35	54%	18%	3.45	0.34	North	North	N/A	N/A	North	North	N/A	N/A
	R28	Bedroom	W32 →	13.7	5.5	8.2	0.40	56%	9%	4.45	0.16	North	North	N/A	N/A	North	North	N/A	N/A
	R29	LKD	W33 →	11.6	5.6	6.0	0.48												
		LKD	W34 →	9.9	5.6	4.3	0.56												
		LKD	W35 ↑	9.8	9.8	0.0	1.00	79%	67%	2.68	0.85	North	North	N/A	N/A	North	North	N/A	N/A
	R30	LKD	W36 →	7.8	7.8	0.0	1.00	35%	35%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	N/A
	R31	Bedroom	W37 →	7.0	7.0	0.0	1.00	64%	64%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	N/A
	R32	Bedroom	W38 ↓	4.6	4.6	0.0	1.00	13%	13%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R33	LKD	W39 ↓	5.2	5.2	0.0	1.00	8%	8%	0.00	1.00	7	7	0	1.00	0	0	N/A	N/A
	R34	Bedroom	W40 ↓	5.9	5.9	0.0	1.00	14%	14%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R35	LKD	W41 ↓	6.3	6.3	0.0	1.00	8%	8%	0.00	1.00	7	7	0	1.00	0	0	N/A	N/A
	R36	Bedroom	W42 ↓	6.7	6.7	0.0	1.00	16%	16%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R37	LKD	W43 ↓	6.4	6.4	0.0	1.00	10%	10%	0.00	1.00	9	9	0	1.00	0	0	N/A	N/A
	R38	Bedroom	W44 ↓	4.5	4.5	0.0	1.00	14%	14%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R39	Bedroom	W45 ↓	7.5	7.3	0.2	0.97	20%	19%	0.06	0.97	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R40	LKD	W46 ↓	8.0	7.5	0.5	0.94	15%	12%	0.79	0.80	14	13	1	0.93	1	0	N/A*	N/A*
	R41	Bedroom	W47 ↓	8.8	7.9	0.9	0.90	28%	24%	0.42	0.85	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R42	Bedroom	W48 ↓	10.6	8.6	2.0	0.81	52%	38%	1.69	0.73	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R43	LKD	W49 ↓	12.7	10.1	2.5	0.80												
		LKD	W50 →	6.8	6.1	0.7	0.90												
		LKD	W51 →	6.9	6.4	0.5	0.93	75%	61%	3.36	0.81	23	20	3	0.87	5	2	N/A*	N/A*
	R44	Bedroom	W52 →	7.4	7.0	0.4	0.94	24%	24%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	N/A
	R45	LKD	W53 ↓	34.0	33.9	N/A	N/A												
		LKD	W54 →	30.6	17.5	13.1	0.57	100%	98%	0.37	0.98	77	75	N/A	N/A	27	27	N/A	N/A
	R46	Bedroom	W55 →	29.4	11.0	18.4	0.37	98%	35%	6.50	0.36	North	North	N/A	N/A	North	North	N/A	N/A
	R47	Bedroom	W56 →	28.9	9.3	19.6	0.32	98%	26%	7.25	0.26	North	North	N/A	N/A	North	North	N/A	N/A
	R48	LKD	W57 →	28.2	7.6	20.6	0.27												

Ratio: N/A or ≥0.8 = inside BRE (N/A* satisfies 4% APSH criterion); N/R = not required

Property, room & window attributes				VSC				NSL				APSH (room)						
Floor	Room	Room use	Window Ref./Orientation	Exis. (% VSC)	Prop. (% VSC)	Loss (% VSC)	Pro./Ex. ratio	Exis. (% rm)	Prop. (% rm)	Loss (m²)	Pro./Ex. ratio	Annual (%APSH)				Winter (%APSH)		
												Exis.	Prop.	Loss	Pro./Ex.	Exis.	Prop.	Pro./Ex.
F03		LKD	W58 ↑	4.8	2.0	2.8	0.42	92%	58%	7.85	0.63	North	North	N/A	N/A	North	North	N/A
	R49	Bedroom	W59 ↑	12.8	9.8	3.0	0.76	41%	40%	0.14	0.97	North	North	N/A	N/A	North	North	N/A
	R1	Bedroom	W1 ↑	13.2	10.7	2.5	0.81	35%	34%	0.06	0.98	North	North	N/A	N/A	North	North	N/A
	R2	LKD	W2 ↑	11.9	9.9	2.0	0.83	20%	19%	0.05	0.99	North	North	N/A	N/A	North	North	N/A
	R3	Bedroom	W3 ↑	9.0	7.3	1.7	0.82	27%	26%	0.09	0.97	North	North	N/A	N/A	North	North	N/A
	R4	LKD	W4 →	13.4	8.2	5.2	0.61											
		LKD	W5 ↑	10.8	9.5	1.2	0.89	32%	23%	1.85	0.71	North	North	N/A	N/A	North	North	N/A
	R5	Bedroom	W6 ↑	10.4	9.4	1.0	0.91	21%	21%	0.00	1.00	North	North	N/A	N/A	North	North	N/A
	R6	Bedroom	W7 ↑	9.9	9.1	0.8	0.92	21%	21%	0.00	1.00	North	North	N/A	N/A	North	North	N/A
	R7	LKD	W8 ↑	9.4	8.7	0.7	0.93	10%	10%	0.00	1.00	North	North	N/A	N/A	North	North	N/A
	R8	LKD	W9 ↑	6.3	6.3	0.0	1.00	15%	15%	0.00	1.00	North	North	N/A	N/A	North	North	N/A
	R9	Bedroom	W10 ↑	5.9	5.6	0.4	0.94	13%	13%	0.00	1.00	North	North	N/A	N/A	North	North	N/A
	R10	Bedroom	W11 →	10.6	8.6	2.0	0.81	75%	72%	0.24	0.97	North	North	N/A	N/A	North	North	N/A
	R11	LKD	W12 →	7.1	5.0	2.1	0.70	94%	42%	14.51	0.44	North	North	N/A	N/A	North	North	N/A
	R12	LKD	W13 →	7.0	4.8	2.2	0.68	96%	43%	13.37	0.45	North	North	N/A	N/A	North	North	N/A
	R13	Bedroom	W14 →	15.9	13.5	2.4	0.85	79%	77%	0.13	0.98	North	North	N/A	N/A	North	North	N/A
	R14	LKD	W15 →	6.8	4.8	2.0	0.70	79%	43%	9.66	0.54	North	North	N/A	N/A	North	North	N/A
	R15	Bedroom	W16 →	12.8	10.9	1.9	0.85	73%	69%	0.36	0.95	North	North	N/A	N/A	North	North	N/A
	R16	Bedroom	W17 ↓	12.8	12.2	0.6	0.95	69%	69%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R17	LKD	W18 ↓	16.6	15.8	0.8	0.95	38%	38%	0.01	1.00	31	31	N/A	N/A	4	4	1.00
	R18	Bedroom	W19 ↓	19.6	18.7	0.9	0.95	78%	78%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R19	Bedroom	W20 ↓	21.0	20.0	1.0	0.95	79%	79%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R20	LKD	W21 ↓	20.4	19.7	0.7	0.97	40%	40%	0.00	1.00	42	42	N/A	N/A	8	8	N/A
	R21	Bedroom	W22 ↓	15.6	15.6	0.0	1.00	77%	77%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R22	LKD	W23 ↓	22.9	20.7	2.2	0.90	42%	42%	0.02	1.00	42	41	N/A	N/A	8	7	N/A
	R23	Bedroom	W24 ↓	24.0	21.3	2.7	0.89	79%	79%	0.01	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R24	Studio	W25 ↓	23.8	20.9	2.9	0.88											
		Studio	W26 ↓	12.3	8.0	4.3	0.65	63%	54%	2.36	0.85	37	29	N/A	N/A	14	12	N/A
	R25	Bedroom	W27 ↓	26.9	20.9	6.0	0.78	85%	80%	0.45	0.95	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R26	LKD	W28 ↓	14.9	8.7	6.2	0.58											
		LKD	W29 →	21.5	6.1	15.4	0.28											
		LKD	W30 →	19.6	6.5	13.1	0.33	100%	72%	6.83	0.72	41	12	29	0.29	14	9	N/A
	R27	Bedroom	W31 →	17.0	6.6	10.4	0.39	54%	22%	3.19	0.41	North	North	N/A	N/A	North	North	N/A
	R28	Bedroom	W32 →	15.0	6.5	8.5	0.43	57%	13%	4.25	0.23	North	North	N/A	N/A	North	North	N/A
	R29	LKD	W33 →	12.7	6.5	6.2	0.51											
		LKD	W34 →	11.0	6.6	4.4	0.60											
		LKD	W35 ↑	10.3	10.3	0.0	1.00	80%	68%	2.67	0.85	North	North	N/A	N/A	North	North	N/A
	R30	LKD	W36 →	8.8	8.8	0.0	1.00	40%	40%	0.00	1.00	North	North	N/A	N/A	North	North	N/A
	R31	Bedroom	W37 →	7.7	7.7	0.0	1.00	75%	75%	0.00	1.00	North	North	N/A	N/A	North	North	N/A
	R32	Bedroom	W38 ↓	5.4	5.4	0.0	1.00	16%	16%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R33	LKD	W39 ↓	6.1	6.1	0.0	1.00	9%	9%	0.00	1.00	9	9	0	1.00	0	0	N/A
	R34	Bedroom	W40 ↓	7.0	7.0	0.0	1.00	17%	17%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R35	LKD	W41 ↓	7.5	7.5	0.0	1.00	10%	10%	0.00	1.00	12	12	0	1.00	0	0	N/A
	R36	Bedroom	W42 ↓	8.0	8.0	0.0	1.00	19%	19%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R37	LKD	W43 ↓	7.7	7.7	0.0	1.00	12%	12%	0.00	1.00	14	14	0	1.00	0	0	N/A
	R38	Bedroom	W44 ↓	5.4	5.4	0.0	1.00	19%	19%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R39	Bedroom	W45 ↓	8.8	8.6	0.2	0.98	23%	23%	0.03	0.99	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R40	LKD	W46 ↓	9.3	8.9	0.4	0.95	16%	14%	0.57	0.86	17	16	1	0.94	1	0	N/A*
	R41	Bedroom	W47 ↓	10.2	9.3	0.8	0.92	31%	29%	0.19	0.94	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R42	Bedroom	W48 ↓	11.9	10.0	2.0	0.84	54%	39%	1.51	0.73	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R43	LKD	W49 ↓	14.0	11.6	2.4	0.83											
		LKD	W50 →	7.7	7.0	0.6	0.92											
		LKD	W51 →	7.8	7.3	0.5	0.94	76%	62%	3.12	0.82	24	22	2	0.92	6	4	N/A*
	R44	Bedroom	W52 →	8.2	7.8	0.4	0.95	27%	27%	0.00	1.00	North	North	N/A	N/A	North	North	N/A
	R45	LKD	W53 ↓	37.3	37.2	N/A	N/A											
		LKD	W54 →	33.0	19.9	13.1	0.60	100%	98%	0.37	0.98	77	75	N/A	N/A	27	27	N/A
	R46	Bedroom	W55 →	32.3	13.4	18.9	0.41	98%	40%	6.07	0.41	North	North	N/A	N/A	North	North	N/A
	R47	Bedroom	W56 →	31.9	11.6	20.3	0.36	98%	32%	6.74	0.33	North	North	N/A	N/A	North	North	N/A
	R48	LKD	W57 →	30.8	9.6	21.2	0.31											
		LKD	W58 ↑	5.3	2.4	3.0	0.44	93%	58%	8.06	0.62	North	North	N/A	N/A	North	North	N/A
	R49	Bedroom	W59 ↑	14.5	11.4	3.1	0.79	44%	43%	0.11	0.98	North	North	N/A	N/A	North	North	N/A
F04	R1	Bedroom	W1 ↑	15.1	12.7	2.4	0.84	39%	38%	0.03	0.99	North	North	N/A	N/A	North	North	N/A
	R2	LKD	W2 ↑	13.7	11.7	1.9	0.86	22%	22%	0.04	0.99	North	North	N/A	N/A	North	North	N/A

Property, room & window attributes				VSC				NSL				APSH (room)							
Floor	Room	Room use	Window Ref./Orientation	Exis. (% VSC)	Prop. (% VSC)	Loss (% VSC)	Pro./Ex. ratio	Exis. (% rm)	Prop. (% rm)	Loss (m ²)	Pro./Ex. ratio	Annual (%APSH)				Winter (%APSH)			
												Exis.	Prop.	Loss	Pro./Ex.	Exis.	Prop.	Pro./Ex.	
	R3	Bedroom	W3 ↑	10.3	8.7	1.6	0.85	31%	31%	0.05	0.98	North	North	N/A	N/A	North	North	N/A	
	R4	LKD	W4 →	14.8	9.9	4.9	0.67												
		LKD	W5 ↑	12.6	11.5	1.2	0.91	34%	28%	1.19	0.82	North	North	N/A	N/A	North	North	N/A	
	R5	Bedroom	W6 ↑	12.3	11.4	0.9	0.93	25%	25%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R6	Bedroom	W7 ↑	12.0	11.2	0.7	0.94	26%	26%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R7	LKD	W8 ↑	11.5	10.8	0.6	0.95	14%	14%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R8	LKD	W9 ↑	8.1	8.1	0.0	1.00	18%	18%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R9	Bedroom	W10 ↑	7.4	7.0	0.3	0.96	18%	18%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R10	Bedroom	W11 →	11.8	9.9	1.8	0.85	77%	77%	0.01	1.00	North	North	N/A	N/A	North	North	N/A	
	R11	LKD	W12 →	7.7	5.9	1.8	0.76	92%	56%	9.54	0.61	North	North	N/A	N/A	North	North	N/A	
	R12	LKD	W13 →	11.2	9.1	2.2	0.81	98%	70%	6.95	0.72	North	North	N/A	N/A	North	North	N/A	
	R13	Bedroom	W14 →	18.3	16.2	2.1	0.88	80%	79%	0.02	1.00	North	North	N/A	N/A	North	North	N/A	
	R14	LKD	W15 →	12.6	10.6	2.0	0.84	89%	56%	8.74	0.63	North	North	N/A	N/A	North	North	N/A	
	R15	Bedroom	W16 →	13.7	12.0	1.7	0.88	73%	71%	0.16	0.98	North	North	N/A	N/A	North	North	N/A	
	R16	Bedroom	W17 ↓	15.4	14.8	0.6	0.96	89%	89%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R17	LKD	W18 ↓	19.5	18.8	0.7	0.96	56%	56%	0.00	1.00	39	39	N/A	N/A	9	9	N/A	
	R18	Bedroom	W19 ↓	23.5	22.7	0.8	0.97	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R19	Bedroom	W20 ↓	25.0	24.1	0.9	0.97	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R20	LKD	W21 ↓	23.5	22.9	0.6	0.97	58%	58%	0.00	1.00	47	47	N/A	N/A	12	12	N/A	
	R21	Bedroom	W22 ↓	18.0	18.0	0.0	1.00												
		Bedroom	W23 ↓	18.3	18.3	0.0	1.00	95%	95%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R22	LKD	W24 ↓	26.4	24.2	2.1	0.92	61%	61%	0.01	1.00	47	46	N/A	N/A	13	12	N/A	
	R23	Bedroom	W25 ↓	27.6	25.0	2.6	0.91	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R24	Studio	W26 ↓	27.5	24.8	2.8	0.90												
		Studio	W27 ↓	15.9	11.8	4.1	0.74	70%	67%	0.56	0.97	41	32	N/A	N/A	18	15	N/A	
	R25	Bedroom	W28 ↓	30.2	24.3	5.9	0.81	97%	94%	0.40	0.96	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R26	LKD	W29 ↓	17.9	11.3	6.6	0.63												
		LKD	W30 →	23.1	7.4	15.7	0.32												
		LKD	W31 →	21.1	7.9	13.2	0.37	100%	76%	6.23	0.76	44	15	29	0.34	16	11	N/A	
	R27	Bedroom	W32 →	18.5	8.0	10.5	0.43	56%	28%	2.85	0.50	North	North	N/A	N/A	North	North	N/A	
	R28	Bedroom	W33 →	16.3	7.8	8.5	0.48	59%	17%	3.96	0.29	North	North	N/A	N/A	North	North	N/A	
	R29	LKD	W34 →	13.8	7.6	6.2	0.55												
		LKD	W35 →	11.7	7.3	4.4	0.62												
		LKD	W36 ↑	2.5	2.5	0.0	1.00	81%	66%	3.44	0.82	North	North	N/A	N/A	North	North	N/A	
	R30	LKD	W37 →	10.0	10.0	0.0	1.00	47%	47%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R31	Bedroom	W38 →	8.7	8.7	0.0	1.00	78%	78%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R32	Bedroom	W39 ↓	6.3	6.3	0.0	1.00	19%	19%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R33	LKD	W40 ↓	7.1	7.1	0.0	1.00	11%	11%	0.00	1.00	12	12	0	1.00	0	0	N/A	
	R34	Bedroom	W41 ↓	8.4	8.4	0.0	1.00	21%	21%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R35	LKD	W42 ↓	8.9	8.9	0.0	1.00	12%	12%	0.00	1.00	14	14	0	1.00	0	0	N/A	
	R36	Bedroom	W43 ↓	9.5	9.5	0.0	1.00	24%	24%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R37	LKD	W44 ↓	9.1	9.1	0.0	1.00	15%	15%	0.00	1.00	20	20	0	1.00	0	0	N/A	
	R38	Bedroom	W45 ↓	6.7	6.7	0.0	1.00	25%	25%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R39	Bedroom	W46 ↓	10.6	10.4	0.2	0.98	26%	26%	0.02	0.99	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R40	LKD	W47 ↓	10.9	10.5	0.4	0.96	18%	16%	0.37	0.92	21	20	1	0.95	1	0	N/A*	
	R41	Bedroom	W48 ↓	12.0	11.2	0.8	0.93	34%	33%	0.08	0.98	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R42	Bedroom	W49 ↓	13.8	12.0	1.8	0.87	56%	47%	0.93	0.84	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R43	LKD	W50 ↓	15.4	13.1	2.3	0.85												
		LKD	W51 →	8.8	8.2	0.6	0.93												
		LKD	W52 →	9.1	8.6	0.5	0.95	76%	64%	2.87	0.84	30	29	N/A	N/A	5	4	0.80	
	R44	Bedroom	W53 →	9.4	9.1	0.4	0.96	30%	30%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R45	LKD	W54 ↓	39.1	39.0	N/A	N/A												
		LKD	W55 →	34.7	22.9	11.8	0.66	100%	98%	0.37	0.98	80	76	N/A	N/A	28	28	N/A	
	R46	Bedroom	W56 →	34.2	16.8	17.4	0.49	98%	56%	5.29	0.57	North	North	N/A	N/A	North	North	N/A	
	R47	Bedroom	W57 →	33.9	14.9	19.0	0.44	98%	48%	5.81	0.49	North	North	N/A	N/A	North	North	N/A	
	R48	LKD	W58 →	32.8	12.3	20.5	0.38												
		LKD	W59 ↑	5.9	2.8	3.1	0.47	94%	59%	8.04	0.62	North	North	N/A	N/A	North	North	N/A	
	R49	Bedroom	W60 ↑	16.5	13.2	3.3	0.80	48%	47%	0.09	0.98	North	North	N/A	N/A	North	North	N/A	
F05	R1	Bedroom	W1 ↑	17.3	15.0	2.3	0.87	43%	43%	0.01	1.00	North	North	N/A	N/A	North	North	N/A	
	R2	LKD	W2 ↑	15.9	14.1	1.8	0.89	25%	25%	0.02	1.00	North	North	N/A	N/A	North	North	N/A	
	R3	Bedroom	W3 ↑	12.0	10.6	1.4	0.88	36%	36%	0.01	1.00	North	North	N/A	N/A	North	North	N/A	
	R4	LKD	W4 →	16.8	12.5	4.3	0.74												
		LKD	W5 ↑	14.8	13.8	1.1	0.93	36%	33%	0.50	0.93	North	North	N/A	N/A	North	North	N/A	

Property, room & window attributes				VSC				NSL				APSH (room)							
Floor	Room	Room use	Window Ref./Orientation	Exis. (% VSC)	Prop. (% VSC)	Loss (% VSC)	Pro./Ex. ratio	Exis. (% nm)	Prop. (% nm)	Loss (m ²)	Pro./Ex. ratio	Annual (%APSH)				Winter (%APSH)			
												Exis.	Prop.	Loss	Pro./Ex.	Exis.	Prop.	Pro./Ex.	
	R5	Bedroom	W6 ↑	14.7	13.9	0.8	0.95	32%	32%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R6	Bedroom	W7 ↑	14.5	13.9	0.7	0.95	32%	32%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R7	LKD	W8 ↑	14.2	13.7	0.5	0.96	16%	16%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R8	LKD	W9 ↑	10.9	10.9	0.0	1.00	26%	26%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R9	Bedroom	W10 ↑	9.5	9.2	0.3	0.97	23%	23%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R10	Bedroom	W11 →	14.3	12.7	1.6	0.89	84%	84%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R11	LKD	W12 →	10.2	8.3	1.9	0.82	98%	68%	8.97	0.69	North	North	N/A	N/A	North	North	N/A	
	R12	LKD	W13 →	11.6	9.7	1.9	0.84	96%	69%	7.82	0.72	North	North	N/A	N/A	North	North	N/A	
	R13	Bedroom	W14 →	21.3	19.4	1.8	0.91	81%	81%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R14	LKD	W15 →	9.9	8.1	1.8	0.82	87%	57%	8.69	0.66	North	North	N/A	N/A	North	North	N/A	
	R15	Bedroom	W16 →	15.5	14.1	1.5	0.91	73%	72%	0.12	0.98	North	North	N/A	N/A	North	North	N/A	
	R16	Bedroom	W17 ↓	18.3	18.1	0.2	0.99	96%	96%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R17	LKD	W18 ↓	12.6	12.0	0.6	0.95	69%	69%	0.00	1.00	19	19	0	1.00	11	11	N/A	
	R18	Bedroom	W19 ↓	28.4	27.7	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R19	Bedroom	W20 ↓	29.1	28.6	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R20	LKD	W21 ↓	16.4	15.9	0.5	0.97	76%	76%	0.01	1.00	26	26	N/A	N/A	17	17	N/A	
	R21	Bedroom	W22 ↓	20.9	20.9	0.0	1.00	95%	95%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R22	LKD	W23 ↓	20.1	18.2	1.9	0.91	75%	75%	0.00	1.00	25	24	1	0.96	15	14	N/A	
	R23	Bedroom	W24 ↓	30.7	28.4	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R24	Studio	W25 ↓	31.4	29.0	N/A	N/A												
		Studio	W26 ↓	19.6	15.9	3.7	0.81	88%	86%	0.47	0.98	48	40	N/A	N/A	25	22	N/A	
	R25	Bedroom	W27 ↓	33.3	27.4	N/A	N/A	97%	94%	0.31	0.97	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R26	LKD	W28 ↓	20.6	13.7	6.9	0.67												
		LKD	W29 →	24.8	9.0	15.8	0.36												
		LKD	W30 →	22.9	9.9	13.0	0.43	100%	78%	4.99	0.78	50	22	28	0.44	22	16	N/A	
	R27	Bedroom	W31 →	20.2	10.1	10.1	0.50	59%	33%	2.38	0.56	North	North	N/A	N/A	North	North	N/A	
	R28	Bedroom	W32 →	18.1	10.0	8.1	0.55	60%	20%	3.71	0.33	North	North	N/A	N/A	North	North	N/A	
	R29	LKD	W33 →	15.5	9.6	5.9	0.62												
		LKD	W34 →	6.0	2.4	3.6	0.40												
		LKD	W35 ↑	13.7	13.7	0.0	1.00	83%	72%	2.56	0.87	North	North	N/A	N/A	North	North	N/A	
	R30	LKD	W36 →	11.4	11.4	0.0	1.00	54%	54%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R31	Bedroom	W37 →	9.7	9.7	0.0	1.00	79%	79%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R32	Bedroom	W38 ↓	7.0	7.0	0.0	1.00	24%	24%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R33	LKD	W39 ↓	7.8	7.8	0.0	1.00	14%	14%	0.00	1.00	16	16	0	1.00	0	0	N/A	
	R34	Bedroom	W40 ↓	9.7	9.7	0.0	1.00	27%	27%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R35	LKD	W41 ↓	10.1	10.1	0.0	1.00	16%	16%	0.00	1.00	18	18	0	1.00	0	0	N/A	
	R36	Bedroom	W42 ↓	11.1	11.1	0.0	1.00	32%	32%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R37	LKD	W43 ↓	10.4	10.4	0.0	1.00	18%	18%	0.00	1.00	22	22	0	1.00	0	0	N/A	
	R38	Bedroom	W44 ↓	7.8	7.8	0.0	1.00	32%	32%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R39	Bedroom	W45 ↓	12.2	12.0	0.2	0.99	30%	30%	0.01	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R40	LKD	W46 ↓	12.2	11.8	0.4	0.97	20%	19%	0.17	0.97	30	30	N/A	N/A	1	1	1.00	
	R41	Bedroom	W47 ↓	13.7	12.9	0.8	0.94	38%	37%	0.05	0.99	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R42	Bedroom	W48 ↓	15.8	14.1	1.7	0.90	58%	55%	0.33	0.95	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R43	LKD	W49 ↓	16.3	14.2	2.1	0.87												
		LKD	W50 →	10.2	9.7	0.5	0.95												
		LKD	W51 →	10.5	10.1	0.4	0.96	77%	66%	2.48	0.86	34	33	N/A	N/A	6	5	N/A	
	R44	Bedroom	W52 →	10.8	10.4	0.3	0.97	34%	34%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R45	LKD	W53 ↓	39.6	39.4	N/A	N/A												
		LKD	W54 →	35.7	26.9	8.8	0.75	100%	98%	0.37	0.98	80	76	N/A	N/A	28	28	N/A	
	R46	Bedroom	W55 →	35.2	21.5	13.7	0.61	98%	97%	3.02	0.99	North	North	N/A	N/A	North	North	N/A	
	R47	Bedroom	W56 →	34.9	19.5	15.4	0.56	98%	94%	3.39	0.96	North	North	N/A	N/A	North	North	N/A	
	R48	LKD	W57 →	34.1	15.9	18.2	0.47												
		LKD	W58 ↑	20.5	15.3	5.2	0.75	96%	73%	6.50	0.76	North	North	N/A	N/A	North	North	N/A	
	R49	Bedroom	W59 ↑	18.7	15.4	3.3	0.82	52%	51%	0.05	0.99	North	North	N/A	N/A	North	North	N/A	
F06	R1	Bedroom	W1 ↑	19.9	17.8	2.1	0.90	49%	49%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R2	LKD	W2 ↑	18.9	17.3	1.6	0.92	28%	28%	0.02	1.00	North	North	N/A	N/A	North	North	N/A	
	R3	Bedroom	W3 ↑	14.9	13.6	1.3	0.91	43%	43%	0.01	1.00	North	North	N/A	N/A	North	North	N/A	
	R4	LKD	W4 →	21.1	17.4	3.7	0.82												
		LKD	W5 ↑	17.4	16.5	0.9	0.95	39%	39%	0.05	0.99	North	North	N/A	N/A	North	North	N/A	
	R5	Bedroom	W6 ↑	17.5	16.8	0.7	0.96	40%	40%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R6	Bedroom	W7 ↑	17.6	17.0	0.6	0.97	41%	41%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R7	LKD	W8 ↑	17.6	17.1	0.5	0.97	20%	20%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R8	LKD	W9 ↑	15.1	15.1	0.0	1.00	33%	33%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	

Property, room & window attributes				VSC				NSL				APSH (room)							
Floor	Room	Room use	Window Ref./Orientation	Exis. (% VSC)	Prop. (% VSC)	Loss (% VSC)	Pro./Ex. ratio	Exis. (% rm)	Prop. (% rm)	Loss (m²)	Pro./Ex. ratio	Annual (%APSH)				Winter (%APSH)			
												Exis.	Prop.	Loss	Pro./Ex.	Exis.	Prop.	Pro./Ex.	
	R9	Bedroom	W10 ↑	13.0	12.8	0.3	0.98	32%	32%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R10	Bedroom	W11 →	18.8	17.4	1.4	0.93	96%	96%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R11	LKD	W12 →	25.0	23.4	1.6	0.94	100%	91%	2.32	0.91	North	North	N/A	N/A	North	North	N/A	
	R12	LKD	W13 →	25.3	23.7	1.6	0.94	99%	83%	4.18	0.83	North	North	N/A	N/A	North	North	N/A	
	R13	Bedroom	W14 →	24.1	22.5	1.6	0.93	83%	83%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R14	LKD	W15 →	20.9	19.4	1.5	0.93	90%	75%	5.77	0.83	North	North	N/A	N/A	North	North	N/A	
	R15	Bedroom	W16 →	17.0	15.8	1.3	0.93	74%	74%	0.03	1.00	North	North	N/A	N/A	North	North	N/A	
	R16	Bedroom	W17 ↓	24.3	24.0	0.3	0.99	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R17	LKD	W18 ↓	18.9	18.4	0.5	0.97	96%	96%	0.00	1.00	30	30	N/A	N/A	18	18	N/A	
	R18	Bedroom	W19 ↓	33.3	32.7	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R19	Bedroom	W20 ↓	33.8	33.4	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R20	LKD	W21 ↓	20.6	20.2	0.4	0.98	98%	98%	0.00	1.00	31	31	N/A	N/A	22	22	N/A	
	R21	Bedroom	W22 ↓	24.1	24.1	0.0	1.00	95%	95%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R22	LKD	W23 ↓	24.3	22.7	1.6	0.93	99%	99%	0.00	1.00	30	29	N/A	N/A	20	19	N/A	
	R23	Bedroom	W24 ↓	34.6	32.7	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R24	Studio	W25 ↓	35.1	33.2	N/A	N/A												
		Studio	W26 ↓	23.1	19.5	3.6	0.85	98%	97%	0.47	0.98	51	45	N/A	N/A	28	25	N/A	
	R25	Bedroom	W27 ↓	36.1	31.0	N/A	N/A	97%	96%	0.16	0.98	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R26	LKD	W28 ↓	23.0	16.3	6.7	0.71												
		LKD	W29 →	26.4	11.3	15.1	0.43												
		LKD	W30 →	24.5	12.4	12.1	0.51	100%	79%	4.82	0.79	53	24	29	0.45	24	18	N/A	
	R27	Bedroom	W31 →	21.9	12.5	9.4	0.57	62%	49%	1.63	0.80	North	North	N/A	N/A	North	North	N/A	
	R28	Bedroom	W32 →	19.9	12.4	7.5	0.62	63%	34%	3.18	0.54	North	North	N/A	N/A	North	North	N/A	
	R29	LKD	W33 →	17.3	12.0	5.3	0.69												
		LKD	W34 →	15.2	11.5	3.7	0.76												
		LKD	W35 ↑	4.2	4.2	0.0	1.00	83%	68%	3.49	0.82	North	North	N/A	N/A	North	North	N/A	
	R30	LKD	W36 →	13.0	13.0	0.0	1.00	65%	65%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R31	Bedroom	W37 →	10.8	10.8	0.0	1.00	81%	81%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R32	Bedroom	W38 ↓	7.8	7.8	0.0	1.00	30%	30%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R33	LKD	W39 ↓	2.4	2.4	0.0	1.00	14%	14%	0.00	1.00	6	6	0	1.00	0	0	N/A	
	R34	Bedroom	W40 ↓	11.4	11.4	0.0	1.00	35%	35%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R35	LKD	W41 ↓	3.1	3.1	0.0	1.00	15%	15%	0.00	1.00	5	5	0	1.00	0	0	N/A	
	R36	Bedroom	W42 ↓	13.3	13.3	0.0	1.00	42%	42%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R37	LKD	W43 ↓	3.3	3.3	0.0	1.00	17%	17%	0.00	1.00	8	8	0	1.00	0	0	N/A	
	R38	Bedroom	W44 ↓	9.8	9.8	0.0	1.00	43%	43%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R39	Bedroom	W45 ↓	14.6	14.4	0.2	0.99	38%	38%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R40	LKD	W46 ↓	4.3	4.0	0.4	0.91	19%	19%	0.07	0.99	12	12	0	1.00	1	1	1.00	
	R41	Bedroom	W47 ↓	16.3	15.6	0.7	0.96	44%	44%	0.02	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R42	Bedroom	W48 ↓	18.2	16.7	1.5	0.92	62%	62%	0.06	0.99	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R43	LKD	W49 ↓	6.1	4.5	1.6	0.74												
		LKD	W50 →	12.1	11.6	0.5	0.96												
		LKD	W51 →	12.3	11.9	0.4	0.97	75%	61%	3.23	0.81	13	12	1	0.92	5	4	0.80	
	R44	Bedroom	W52 →	12.5	12.2	0.3	0.98	39%	39%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R45	LKD	W53 ↓	39.6	39.5	N/A	N/A												
		LKD	W54 →	36.3	28.6	N/A	N/A	99%	99%	0.02	1.00	81	77	N/A	N/A	28	28	N/A	
	R46	Bedroom	W55 →	35.9	25.2	10.7	0.70	98%	98%	0.05	0.99	North	North	N/A	N/A	North	North	N/A	
	R47	Bedroom	W56 →	35.6	20.4	15.2	0.57	98%	95%	0.32	0.96	North	North	N/A	N/A	North	North	N/A	
	R48	LKD	W57 →	35.0	17.7	17.3	0.51												
		LKD	W58 ↑	22.6	18.0	4.6	0.80	97%	78%	4.16	0.81	North	North	N/A	N/A	North	North	N/A	
	R49	Bedroom	W59 ↑	21.0	17.7	3.3	0.84	57%	57%	0.02	1.00	North	North	N/A	N/A	North	North	N/A	
F07	R1	Bedroom	W1 ↓	37.3	37.0	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R2	LKD	W2 ↓	25.9	25.4	0.5	0.98	97%	97%	0.00	1.00	36	36	N/A	N/A	24	24	N/A	
	R3	Bedroom	W3 ↓	37.2	36.7	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R4	Bedroom	W4 ↓	37.1	36.7	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	LKD	W5 ↓	24.1	23.8	0.3	0.99	98%	98%	0.00	1.00	31	31	N/A	N/A	22	22	N/A	
	R6	Bedroom	W6 ↓	26.5	26.5	0.0	1.00	95%	95%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W7 ↓	27.7	26.4	1.3	0.95	99%	99%	0.00	1.00	30	30	N/A	N/A	20	20	N/A	
	R8	Bedroom	W8 ↓	37.4	35.9	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	Studio	W9 ↓	37.7	36.3	N/A	N/A												
		Studio	W10 ↓	25.9	23.0	2.8	0.89	98%	97%	0.42	0.98	51	48	N/A	N/A	28	25	N/A	
	R10	Bedroom	W11 ↓	38.1	33.9	N/A	N/A	97%	97%	0.05	0.99	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R11	LKD	W12 ↓	24.9	18.7	6.2	0.75												
		LKD	W13 →	27.9	14.4	13.5	0.52												

Property, room & window attributes				VSC				NSL				APSH (room)						
Floor	Room	Room use	Window Ref./Orientation	Exis. (% VSC)	Prop. (% VSC)	Loss (% VSC)	Pro./Ex. ratio	Exis. (% rm)	Prop. (% rm)	Loss (m²)	Pro./Ex. ratio	Annual (%APSH)				Winter (%APSH)		
												Exis.	Prop.	Loss	Pro./Ex.	Exis.	Prop.	Pro./Ex.
		LKD	W14 →	26.3	15.6	10.7	0.59	100%	80%	4.80	0.80	53	27	N/A	N/A	24	18	N/A
	R12	Bedroom	W15 →	23.9	15.8	8.1	0.66	67%	64%	0.83	0.95	North	North	N/A	N/A	North	North	N/A
	R13	Bedroom	W16 →	22.0	15.7	6.3	0.71	67%	49%	2.23	0.73	North	North	N/A	N/A	North	North	N/A
	R14	LKD	W17 →	19.4	15.0	4.4	0.77											
		LKD	W18 →	7.9	4.8	3.1	0.61											
		LKD	W19 ↑	18.5	18.5	0.0	1.00	84%	76%	1.92	0.90	North	North	N/A	N/A	North	North	N/A
	R15	LKD	W20 →	15.0	15.0	0.0	1.00	79%	79%	0.00	1.00	North	North	N/A	N/A	North	North	N/A
	R16	Bedroom	W21 →	12.1	12.1	0.0	1.00	82%	82%	0.00	1.00	North	North	N/A	N/A	North	North	N/A
	R17	Bedroom	W22 ↓	9.5	9.5	0.0	1.00	40%	40%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R18	LKD	W23 ↓	3.8	3.8	0.0	1.00	18%	18%	0.00	1.00	8	8	0	1.00	0	0	N/A
	R19	Bedroom	W24 ↓	14.0	14.0	0.0	1.00	47%	47%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R20	LKD	W25 ↓	5.0	5.0	0.0	1.00	19%	19%	0.00	1.00	8	8	0	1.00	0	0	N/A
	R21	Bedroom	W26 ↓	16.1	16.1	0.0	1.00	56%	56%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R22	LKD	W27 ↓	5.8	5.8	0.0	1.00	24%	24%	0.00	1.00	11	11	0	1.00	1	1	1.00
	R23	Bedroom	W28 ↓	12.2	12.2	0.0	1.00	57%	57%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R24	Bedroom	W29 ↓	17.5	17.3	0.1	0.99	49%	49%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R25	LKD	W30 ↓	6.3	6.0	0.3	0.95	24%	23%	0.02	1.00	13	13	0	1.00	1	1	1.00
	R26	Bedroom	W31 ↓	19.2	18.6	0.6	0.97	54%	53%	0.01	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R27	Bedroom	W32 ↓	21.1	19.8	1.2	0.94	68%	68%	0.02	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R28	LKD	W33 ↓	7.9	6.5	1.4	0.82											
		LKD	W34 →	14.4	14.0	0.4	0.97											
		LKD	W35 →	14.6	14.3	0.3	0.98	75%	64%	2.62	0.85	16	15	1	0.94	7	6	N/A
	R29	Bedroom	W36 →	14.6	14.4	0.2	0.98	45%	45%	0.00	1.00	North	North	N/A	N/A	North	North	N/A
F08	R1	Bedroom	W1 ↓	37.4	37.2	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R2	LKD	W2 ↓	26.0	25.7	0.3	0.99	97%	97%	0.00	1.00	36	36	N/A	N/A	24	24	N/A
	R3	Bedroom	W3 ↓	37.4	37.0	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R4	Bedroom	W4 ↓	37.2	36.9	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R5	LKD	W5 ↓	24.2	24.0	0.1	0.99	98%	98%	0.00	1.00	31	31	N/A	N/A	22	22	N/A
	R6	Bedroom	W6 ↓	26.5	26.5	0.0	1.00	95%	95%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R7	LKD	W7 ↓	27.8	26.9	0.9	0.97	99%	99%	0.00	1.00	30	30	N/A	N/A	20	20	N/A
	R8	Bedroom	W8 ↓	37.5	36.4	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R9	Studio	W9 ↓	37.9	36.8	N/A	N/A											
		Studio	W10 ↓	25.9	23.8	2.1	0.92	98%	98%	0.09	1.00	51	48	N/A	N/A	28	25	N/A
	R10	Bedroom	W11 ↓	38.3	35.0	N/A	N/A	97%	97%	0.01	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R11	LKD	W12 ↓	24.9	19.6	5.3	0.79											
		LKD	W13 →	29.8	18.4	11.4	0.62											
		LKD	W14 →	28.4	19.7	8.7	0.69	100%	79%	4.73	0.79	53	32	N/A	N/A	24	18	N/A
	R12	Bedroom	W15 →	26.3	19.9	6.4	0.76	75%	74%	0.03	1.00	North	North	N/A	N/A	North	North	N/A
	R13	Bedroom	W16 →	24.7	19.7	5.0	0.80	74%	62%	1.08	0.84	North	North	N/A	N/A	North	North	N/A
	R14	LKD	W17 →	22.7	18.6	4.0	0.82											
		LKD	W18 →	20.7	17.8	2.8	0.86											
		LKD	W19 ↑	9.7	9.7	0.0	1.00	83%	69%	3.31	0.83	North	North	N/A	N/A	North	North	N/A
	R15	LKD	W20 →	17.5	17.5	0.0	1.00	86%	86%	0.00	1.00	North	North	N/A	N/A	North	North	N/A
	R16	Bedroom	W21 →	13.8	13.8	0.0	1.00	84%	84%	0.00	1.00	North	North	N/A	N/A	North	North	N/A
	R17	Bedroom	W22 ↓	11.6	11.6	0.0	1.00	54%	54%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R18	LKD	W23 ↓	6.0	6.0	0.0	1.00	24%	24%	0.00	1.00	8	8	0	1.00	0	0	N/A
	R19	Bedroom	W24 ↓	17.3	17.3	0.0	1.00	67%	67%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R20	LKD	W25 ↓	8.5	8.5	0.0	1.00	26%	26%	0.00	1.00	10	10	0	1.00	1	1	1.00
	R21	Bedroom	W26 ↓	19.7	19.7	0.0	1.00	76%	76%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R22	LKD	W27 ↓	9.2	9.2	0.0	1.00	35%	35%	0.00	1.00	15	15	0	1.00	4	4	1.00
	R23	Bedroom	W28 ↓	15.1	15.1	0.0	1.00	78%	78%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R24	Bedroom	W29 ↓	21.0	20.9	0.1	0.99	67%	67%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R25	LKD	W30 ↓	9.8	9.6	0.2	0.97	30%	29%	0.01	1.00	15	15	0	1.00	3	3	1.00
	R26	Bedroom	W31 ↓	22.5	22.1	0.5	0.98	70%	70%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R27	Bedroom	W32 ↓	24.4	23.5	0.9	0.96	77%	77%	0.01	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R28	LKD	W33 ↓	11.0	9.9	1.1	0.90											
		LKD	W34 →	17.5	17.2	0.3	0.98											
		LKD	W35 →	17.5	17.3	0.2	0.99	76%	70%	1.40	0.92	23	23	0	1.00	8	8	N/A
	R29	Bedroom	W36 →	17.3	17.2	0.2	0.99	54%	54%	0.00	1.00	North	North	N/A	N/A	North	North	N/A
F09	R1	Bedroom	W1 ↓	37.7	37.5	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R2	LKD	W2 ↓	26.1	25.9	0.2	0.99	97%	97%	0.00	1.00	36	36	N/A	N/A	24	24	N/A
	R3	Bedroom	W3 ↓	37.7	37.4	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R
	R4	Bedroom	W4 ↓	37.5	37.3	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R

Property, room & window attributes				VSC				NSL				APSH (room)							
Floor	Room	Room use	Window Ref./Orientation	Exis. (% VSC)	Prop. (% VSC)	Loss (% VSC)	Pro./Ex. ratio	Exis. (% rm)	Prop. (% rm)	Loss (m²)	Pro./Ex. ratio	Annual (%APSH)				Winter (%APSH)			
												Exis.	Prop.	Loss	Pro./Ex.	Exis.	Prop.	Pro./Ex.	
	R5	LKD	W5 ↓	24.2	24.1	0.1	0.99	98%	98%	0.00	1.00	31	31	N/A	N/A	22	22	N/A	
	R6	Bedroom	W6 ↓	26.7	26.7	0.0	1.00	95%	95%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W7 ↓	27.9	27.3	N/A	N/A	99%	99%	0.00	1.00	30	30	N/A	N/A	20	20	N/A	
	R8	Bedroom	W8 ↓	37.8	37.1	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	Studio	W9 ↓	38.2	37.3	N/A	N/A												
		Studio	W10 ↓	26.0	24.5	1.5	0.94	98%	98%	0.01	1.00	51	48	N/A	N/A	28	25	N/A	
	R10	Bedroom	W11 ↓	38.6	36.3	N/A	N/A	97%	97%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R11	LKD	W12 ↓	25.0	21.3	3.7	0.85												
		LKD	W13 →	31.8	23.5	8.3	0.74												
		LKD	W14 →	30.8	24.7	6.1	0.80	100%	85%	3.42	0.85	53	36	N/A	N/A	24	18	N/A	
	R12	Bedroom	W15 →	29.1	23.4	5.8	0.80	90%	90%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R13	Bedroom	W16 →	28.0	23.5	4.4	0.84	89%	89%	0.01	1.00	North	North	N/A	N/A	North	North	N/A	
	R14	LKD	W17 →	25.7	22.7	3.0	0.88												
		LKD	W18 →	14.8	12.6	2.1	0.86												
		LKD	W19 ↑	24.7	24.7	0.0	1.00	90%	87%	0.88	0.96	North	North	N/A	N/A	North	North	N/A	
	R15	LKD	W20 →	20.7	20.7	0.0	1.00	93%	93%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R16	Bedroom	W21 →	16.4	16.4	0.0	1.00	89%	89%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R17	Bedroom	W22 ↓	14.4	14.4	0.0	1.00	82%	82%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R18	LKD	W23 ↓	8.8	8.8	0.0	1.00	34%	34%	0.00	1.00	12	12	0	1.00	4	4	1.00	
	R19	Bedroom	W24 ↓	21.6	21.6	0.0	1.00	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R20	LKD	W25 ↓	12.9	12.9	0.0	1.00	42%	42%	0.00	1.00	19	19	0	1.00	8	8	N/A	
	R21	Bedroom	W26 ↓	24.2	24.2	0.0	1.00	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R22	LKD	W27 ↓	13.2	13.2	0.0	1.00	49%	49%	0.00	1.00	19	19	0	1.00	8	8	N/A	
	R23	Bedroom	W28 ↓	18.1	18.1	0.0	1.00	96%	96%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R24	Bedroom	W29 ↓	25.2	25.1	0.1	1.00	96%	96%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R25	LKD	W30 ↓	13.9	13.7	0.2	0.99	40%	40%	0.00	1.00	21	21	0	1.00	9	9	N/A	
	R26	Bedroom	W31 ↓	26.4	26.1	0.3	0.99	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R27	Bedroom	W32 ↓	28.3	27.7	N/A	N/A	96%	96%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R28	LKD	W33 ↓	14.4	13.6	0.8	0.94												
		LKD	W34 →	21.3	21.0	0.2	0.99												
		LKD	W35 →	21.2	21.0	0.2	0.99	82%	82%	0.09	1.00	32	32	N/A	N/A	14	14	N/A	
	R29	Bedroom	W36 →	20.7	20.6	0.1	0.99	69%	69%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
F10	R1	Bedroom	W1 ↓	38.4	38.3	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R2	LKD	W2 ↓	26.2	26.1	0.1	1.00	97%	97%	0.00	1.00	36	36	N/A	N/A	24	24	N/A	
	R3	Bedroom	W3 ↓	38.4	38.3	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R4	Bedroom	W4 ↓	38.3	38.2	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	LKD	W5 ↓	24.4	24.3	0.1	1.00	98%	98%	0.00	1.00	31	31	N/A	N/A	22	22	N/A	
	R6	Bedroom	W6 ↓	27.5	27.5	N/A	N/A	95%	95%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W7 ↓	28.0	27.6	N/A	N/A	99%	99%	0.00	1.00	30	30	N/A	N/A	20	20	N/A	
	R8	Bedroom	W8 ↓	38.5	38.0	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	Studio	W9 ↓	38.8	38.3	N/A	N/A												
		Studio	W10 ↓	25.9	24.9	0.9	0.96	98%	98%	0.00	1.00	50	48	N/A	N/A	28	26	N/A	
	R10	Bedroom	W11 ↓	39.1	37.8	N/A	N/A	97%	97%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R11	LKD	W12 ↓	25.1	22.1	3.1	0.88												
		LKD	W13 →	34.0	29.5	N/A	N/A												
		LKD	W14 →	33.4	28.4	N/A	N/A	100%	100%	0.00	1.00	53	46	N/A	N/A	24	21	N/A	
	R12	Bedroom	W15 →	32.4	28.7	N/A	N/A	97%	97%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R13	Bedroom	W16 →	31.6	28.8	N/A	N/A	97%	97%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R14	LKD	W17 →	30.8	28.9	N/A	N/A												
		LKD	W18 →	29.6	28.2	N/A	N/A												
		LKD	W19 ↑	15.3	15.3	0.0	1.00	99%	99%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R15	LKD	W20 →	24.9	24.9	0.0	1.00	98%	98%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R16	Bedroom	W21 →	19.1	19.1	0.0	1.00	94%	94%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R17	Bedroom	W22 ↓	18.1	18.1	0.0	1.00	86%	86%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R18	LKD	W23 ↓	12.2	12.2	0.0	1.00	61%	61%	0.00	1.00	18	18	0	1.00	10	10	N/A	
	R19	Bedroom	W24 ↓	27.6	27.6	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R20	LKD	W25 ↓	17.8	17.8	0.0	1.00	70%	70%	0.00	1.00	23	23	0	1.00	12	12	N/A	
	R21	Bedroom	W26 ↓	29.4	29.4	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R22	LKD	W27 ↓	17.6	17.6	0.0	1.00	73%	73%	0.00	1.00	24	24	0	1.00	13	13	N/A	
	R23	Bedroom	W28 ↓	21.8	21.8	0.0	1.00	96%	96%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R24	Bedroom	W29 ↓	30.3	30.2	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R25	LKD	W30 ↓	18.3	18.2	0.1	0.99	62%	62%	0.00	1.00	30	30	N/A	N/A	18	18	N/A	
	R26	Bedroom	W31 ↓	31.0	30.8	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	

Property, room & window attributes				VSC				NSL				APSH (room)							
Floor	Room	Room use	Window Ref./Orientation	Exis. (% VSC)	Prop. (% VSC)	Loss (% VSC)	Pro./Ex. ratio	Exis. (% rm)	Prop. (% rm)	Loss (m²)	Pro./Ex. ratio	Annual (%APSH)				Winter (%APSH)			
												Exis.	Prop.	Loss	Pro./Ex.	Exis.	Prop.	Pro./Ex.	
	R27	Bedroom	W32 ↓	32.5	32.0	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R28	LKD	W33 ↓	18.1	17.6	0.5	0.97												
		LKD	W34 →	25.7	25.5	0.1	0.99												
		LKD	W35 →	25.5	25.4	0.1	1.00	100%	100%	0.00	1.00	37	37	N/A	N/A	17	17	N/A	
	R29	Bedroom	W36 →	24.8	24.7	0.1	1.00	88%	88%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
F11	R1	Bedroom	W1 ↓	39.6	39.5	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R2	LKD	W2 ↓	39.5	39.5	N/A	N/A	97%	97%	0.00	1.00	65	65	N/A	N/A	27	27	N/A	
	R3	Bedroom	W3 ↓	39.5	39.5	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R4	Bedroom	W4 ↓	39.3	39.2	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	LKD	W5 ↓	38.0	38.0	N/A	N/A	98%	98%	0.00	1.00	61	61	N/A	N/A	25	25	N/A	
	R6	Bedroom	W6 ↓	29.4	29.4	N/A	N/A	96%	96%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W7 ↓	39.6	39.4	N/A	N/A	99%	99%	0.00	1.00	57	57	N/A	N/A	23	23	N/A	
	R8	Bedroom	W8 ↓	39.6	39.4	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	Studio	W9 ↓	39.6	39.4	N/A	N/A												
		Studio	W10 ↓	39.6	39.2	N/A	N/A	98%	98%	0.00	1.00	67	67	N/A	N/A	28	28	N/A	
	R10	Bedroom	W11 ↓	39.6	39.0	N/A	N/A	97%	97%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R11	LKD	W12 ↓	39.5	38.2	N/A	N/A												
		LKD	W13 →	36.2	33.0	N/A	N/A												
		LKD	W14 →	36.1	33.9	N/A	N/A	100%	100%	0.00	1.00	80	78	N/A	N/A	28	26	N/A	
	R12	Bedroom	W15 →	35.6	34.0	N/A	N/A	97%	97%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R13	Bedroom	W16 →	35.3	34.0	N/A	N/A	97%	97%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R14	LKD	W17 →	34.9	34.0	N/A	N/A												
		LKD	W18 →	33.9	33.2	N/A	N/A												
		LKD	W19 ↑	30.4	30.4	N/A	N/A	100%	100%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R15	LKD	W20 →	30.8	30.8	N/A	N/A	99%	99%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R16	Bedroom	W21 →	23.6	23.6	0.0	1.00	98%	98%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R17	Bedroom	W22 ↓	23.9	23.9	0.0	1.00	96%	96%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R18	LKD	W23 ↓	30.6	30.6	N/A	N/A	99%	99%	0.00	1.00	58	58	N/A	N/A	20	20	N/A	
	R19	Bedroom	W24 ↓	34.1	34.1	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R20	LKD	W25 ↓	34.2	34.2	N/A	N/A	99%	99%	0.00	1.00	54	54	N/A	N/A	21	21	N/A	
	R21	Bedroom	W26 ↓	35.2	35.2	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R22	LKD	W27 ↓	33.6	33.6	N/A	N/A	100%	100%	0.00	1.00	55	55	N/A	N/A	22	22	N/A	
	R23	Bedroom	W28 ↓	27.0	27.0	0.0	1.00	97%	97%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R24	Bedroom	W29 ↓	35.7	35.6	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R25	LKD	W30 ↓	35.2	35.1	N/A	N/A	97%	97%	0.00	1.00	65	65	N/A	N/A	27	27	N/A	
	R26	Bedroom	W31 ↓	36.0	35.9	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R27	Bedroom	W32 ↓	36.4	36.1	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R28	LKD	W33 ↓	36.2	35.9	N/A	N/A												
		LKD	W34 →	30.3	30.2	N/A	N/A												
		LKD	W35 →	30.1	30.0	N/A	N/A	100%	100%	0.00	1.00	76	76	N/A	N/A	27	27	N/A	
	R29	Bedroom	W36 →	29.3	29.3	N/A	N/A	99%	99%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
Block F																			
F00	R1	LKD	W1 →	17.7	0.6	17.1	0.03												
		LKD	W18 ←	7.6	6.1	1.5	0.81	51%	27%	7.47	0.54	19	6	13	0.32	2	1	0.50	
	R2	LKD	W2 →	18.4	3.3	15.1	0.18												
		LKD	W16 ←	7.9	7.8	0.1	0.99												
		LKD	W17 ←	7.4	6.9	0.5	0.93	51%	33%	8.17	0.64	9	2	7	0.22	0	0	N/A	
	R3	LKD	W3 →	17.5	5.4	12.1	0.31												
		LKD	W15 ←	8.7	8.5	0.1	0.98	72%	49%	10.65	0.68	10	1	9	0.10	0	0	N/A	
	R4	LKD	W4 →	16.8	5.2	11.6	0.31												
		LKD	W14 ←	8.6	8.6	0.1	0.99	84%	43%	13.69	0.51	13	0	13	0.00	1	0	0.00	
	R5	LKD	W5 →	14.4	11.8	2.6	0.82	69%	66%	0.95	0.95	North	North	N/A	N/A	North	North	N/A	
	R6	Bedroom	W6 →	12.4	11.8	0.6	0.95	77%	77%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R7	Bedroom	W7 ↓	14.1	9.2	4.9	0.65	83%	53%	3.43	0.63	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R8	LKD	W8 ↓	16.4	11.4	5.0	0.69	90%	64%	8.43	0.71	33	22	11	0.67	9	2	0.22	
	R9	Bedroom	W9 ↓	17.4	12.6	4.8	0.72	93%	71%	2.12	0.76	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R10	LKD	W10 ↓	18.0	13.7	4.3	0.76	69%	48%	5.69	0.69	33	25	N/A	N/A	7	3	0.43	
	R11	Bedroom	W11 ↓	18.5	14.8	3.7	0.80	90%	75%	1.56	0.83	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R12	LKD	W12 ↓	18.5	15.2	3.2	0.82	65%	54%	2.93	0.84	34	28	N/A	N/A	8	5	N/A	
	R13	Bedroom	W13 ↓	17.9	15.2	2.7	0.85	84%	78%	0.71	0.92	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
F01	R1	Bedroom	W1 →	21.1	0.7	20.4	0.03	77%	2%	8.88	0.03	North	North	N/A	N/A	North	North	N/A	
	R2	Bedroom	W2 →	21.5	7.6	13.9	0.35	74%	38%	6.38	0.51	North	North	N/A	N/A	North	North	N/A	

Property, room & window attributes				VSC				NSL				APSH (room)							
Floor	Room	Room use	Window Ref./Orientation	Exis. (% VSC)	Prop. (% VSC)	Loss (% VSC)	Pro./Ex. ratio	Exis. (% rm)	Prop. (% rm)	Loss (m ²)	Pro./Ex. ratio	Annual (%APSH)				Winter (%APSH)			
												Exis.	Prop.	Loss	Pro./Ex.	Exis.	Prop.	Pro./Ex.	
	R3	Bedroom	W3 →	20.1	14.1	6.0	0.70	90%	87%	0.34	0.97	North	North	N/A	N/A	North	North	N/A	
	R4	Bedroom	W4 →	19.1	14.5	4.6	0.76	85%	81%	0.61	0.95	North	North	N/A	N/A	North	North	N/A	
	R5	LKD	W5 →	16.3	15.3	1.0	0.94	80%	79%	0.34	0.99	North	North	N/A	N/A	North	North	N/A	
	R6	Bedroom	W6 →	13.8	13.2	0.7	0.95	81%	81%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R7	Bedroom	W7 ↓	15.6	10.6	5.0	0.68	86%	65%	2.49	0.75	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R8	LKD	W8 ↓	18.6	13.5	5.1	0.72	95%	75%	5.59	0.78	38	29	N/A	N/A	11	5	N/A	
	R9	Bedroom	W9 ↓	19.9	14.9	5.0	0.75	95%	84%	1.06	0.88	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R10	LKD	W10 ↓	20.7	16.2	4.5	0.78	79%	56%	6.01	0.71	37	27	N/A	N/A	10	4	0.40	
	R11	Bedroom	W11 ↓	21.3	17.3	4.0	0.81	96%	90%	0.55	0.94	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R12	LKD	W12 ↓	21.6	18.2	3.5	0.84	70%	61%	2.57	0.87	42	36	N/A	N/A	12	9	N/A	
	R13	Bedroom	W13 ↓	21.7	18.8	2.9	0.87	94%	91%	0.30	0.97	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R14	Bedroom	W14 ←	9.1	7.9	1.2	0.87	51%	50%	0.25	0.98	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
F02	R1	Bedroom	W1 →	23.5	0.9	22.6	0.04	87%	2%	9.16	0.02	North	North	N/A	N/A	North	North	N/A	
	R2	LKD	W2 →	17.7	16.7	1.0	0.94	84%	84%	0.20	0.99	North	North	N/A	N/A	North	North	N/A	
	R3	Bedroom	W3 →	14.7	14.0	0.7	0.95	83%	83%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R4	Bedroom	W4 ↓	16.4	11.5	5.0	0.70	87%	65%	2.53	0.74	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	LKD	W5 ↓	20.2	14.8	5.4	0.73	96%	76%	5.40	0.79	40	32	N/A	N/A	13	7	N/A	
	R6	Bedroom	W6 ↓	21.9	16.7	5.2	0.76	96%	86%	0.95	0.90	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W7 ↓	22.8	18.3	4.5	0.80	87%	69%	4.70	0.80	43	34	N/A	N/A	13	7	N/A	
	R8	Bedroom	W8 ↓	23.6	19.4	4.1	0.82	98%	96%	0.17	0.98	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	LKD	W9 ↓	24.0	20.4	3.6	0.85	77%	70%	1.84	0.91	45	39	N/A	N/A	13	9	N/A	
	R10	Bedroom	W10 ↓	24.2	21.1	3.0	0.87	98%	96%	0.18	0.98	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R11	LKD	W11 ←	11.4	10.0	1.4	0.87	53%	53%	0.15	0.99	12	12	0	1.00	4	4	1.00	
F03	R1	Bedroom	W1 →	26.0	1.0	25.0	0.04	97%	3%	10.11	0.03	North	North	N/A	N/A	North	North	N/A	
	R2	LKD	W2 →	18.3	17.3	1.1	0.94	87%	87%	0.20	0.99	North	North	N/A	N/A	North	North	N/A	
	R3	Bedroom	W3 →	15.4	14.9	0.5	0.97	84%	84%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R4	Bedroom	W4 ↓	16.8	12.4	4.5	0.73	87%	66%	2.41	0.76	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	LKD	W5 ↓	21.2	15.8	5.4	0.75	97%	78%	5.21	0.80	41	33	N/A	N/A	14	8	N/A	
	R6	Bedroom	W6 ↓	23.7	18.5	5.2	0.78	96%	88%	0.81	0.91	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W7 ↓	24.3	19.6	4.7	0.81	99%	96%	0.70	0.97	49	42	N/A	N/A	17	11	N/A	
	R8	Bedroom	W8 ↓	25.6	21.4	4.2	0.84	98%	97%	0.12	0.99	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	LKD	W9 ↓	25.8	22.2	3.7	0.86	93%	89%	1.14	0.96	51	45	N/A	N/A	17	12	N/A	
	R10	Bedroom	W10 ↓	26.5	23.4	3.1	0.88	98%	97%	0.07	0.99	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R11	LKD	W11 ←	12.7	11.2	1.5	0.88	56%	56%	0.14	0.99	13	13	0	1.00	5	5	N/A	
F04	R1	Bedroom	W1 →	28.5	1.2	27.3	0.04	98%	4%	10.06	0.04	North	North	N/A	N/A	North	North	N/A	
	R2	LKD	W2 →	11.6	10.6	1.0	0.91	85%	85%	0.20	0.99	North	North	N/A	N/A	North	North	N/A	
	R3	Bedroom	W3 →	15.9	15.6	0.3	0.98	84%	84%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R4	Bedroom	W4 ↓	17.3	13.1	4.1	0.76	87%	67%	2.21	0.78	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	LKD	W5 ↓	14.2	9.2	5.0	0.65	96%	75%	5.85	0.78	18	14	4	N/A*	12	8	N/A	
	R6	Bedroom	W6 ↓	25.1	20.0	5.1	0.80	96%	89%	0.66	0.93	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W7 ↓	15.5	11.1	4.4	0.72	98%	94%	1.00	0.96	22	17	5	0.77	15	10	N/A	
	R8	Bedroom	W8 ↓	27.1	22.9	4.2	0.84	98%	97%	0.06	0.99	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	LKD	W9 ↓	17.0	13.4	3.6	0.79	97%	91%	1.44	0.95	24	19	5	0.79	15	10	N/A	
	R10	Bedroom	W10 ↓	29.1	25.8	3.3	0.89	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R11	LKD	W11 ←	14.2	12.6	1.6	0.89	61%	60%	0.14	0.99	14	13	1	0.93	6	5	N/A	
F05	R1	Bedroom	W1 →	31.0	1.5	29.5	0.05	98%	4%	10.04	0.04	North	North	N/A	N/A	North	North	N/A	
	R2	LKD	W2 ↓	21.8	11.4	10.4	0.52												
		LKD	W3 →	12.6	11.6	1.0	0.92	97%	92%	1.40	0.95	35	21	14	0.60	12	3	0.25	
	R3	Bedroom	W4 →	17.0	16.6	0.3	0.98	84%	84%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R4	Bedroom	W5 ↓	18.5	14.8	3.7	0.80	87%	69%	2.06	0.79	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	LKD	W6 ↓	15.6	10.8	4.8	0.69	96%	75%	5.78	0.78	18	14	4	N/A*	12	8	N/A	
	R6	Bedroom	W7 ↓	27.3	22.8	4.5	0.84	96%	91%	0.51	0.94	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W8 ↓	17.4	13.2	4.2	0.76	98%	95%	0.95	0.96	24	19	5	0.79	16	11	N/A	
	R8	Bedroom	W9 ↓	29.4	25.4	4.0	0.86	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	LKD	W10 ↓	19.1	15.4	3.7	0.81	97%	93%	0.95	0.96	27	22	5	0.81	17	12	N/A	
	R10	Bedroom	W11 ↓	31.5	28.2	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R11	LKD	W12 ←	15.2	13.5	1.7	0.89	64%	63%	0.14	0.99	15	14	1	0.93	7	6	N/A	
F06	R1	Bedroom	W1 →	32.5	1.8	30.7	0.06	98%	4%	10.03	0.04	North	North	N/A	N/A	North	North	N/A	
	R2	LKD	W2 ↓	22.8	13.5	9.3	0.59												
		LKD	W3 →	13.5	12.5	1.0	0.93	97%	94%	0.82	0.97	38	26	N/A	N/A	12	3	0.25	
	R3	Bedroom	W4 →	17.7	17.4	0.3	0.98	84%	84%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R4	Bedroom	W5 ↓	19.2	15.5	3.7	0.81	87%	72%	1.71	0.83	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	LKD	W6 ↓	16.5	12.2	4.3	0.74	96%	75%	5.69	0.78	18	14	4	N/A*	12	8	N/A	

Property, room & window attributes				VSC				NSL				APSH (room)							
Floor	Room	Room use	Window Ref./Orientation	Exis. (% VSC)	Prop. (% VSC)	Loss (% VSC)	Pro./Ex. ratio	Exis. (% rm)	Prop. (% rm)	Loss (m ²)	Pro./Ex. ratio	Annual (%APSH)				Winter (%APSH)			
												Exis.	Prop.	Loss	Pro./Ex.	Exis.	Prop.	Pro./Ex.	
	R6	Bedroom	W7 ↓	28.4	24.1	4.3	0.85	96%	93%	0.27	0.97	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W8 ↓	18.6	14.9	3.7	0.80	98%	95%	0.85	0.97	26	21	5	0.81	17	12	N/A	
	R8	Bedroom	W9 ↓	30.5	26.9	3.6	0.88	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	LKD	W10 ↓	20.5	17.1	3.3	0.84	97%	95%	0.66	0.98	27	23	4	0.85	17	13	N/A	
	R10	Bedroom	W11 ↓	32.8	29.9	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R11	LKD	W12 ←	9.2	7.7	1.5	0.83	59%	58%	0.14	0.99	13	12	1	0.92	8	7	N/A	
F07	R1	Bedroom	W1 →	33.8	2.7	31.1	0.08	98%	4%	10.03	0.04	North	North	N/A	N/A	North	North	N/A	
	R2	LKD	W2 ↓	23.6	15.6	8.0	0.66												
		LKD	W3 →	14.2	13.3	0.9	0.94	97%	96%	0.34	0.99	40	29	N/A	N/A	13	4	0.31	
	R3	Bedroom	W4 →	18.5	18.2	0.3	0.98	84%	84%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R4	Bedroom	W5 ↓	19.6	16.3	3.3	0.83	87%	76%	1.21	0.88	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	LKD	W6 ↓	17.1	13.6	3.5	0.79	97%	77%	5.25	0.80	19	16	3	0.84	13	10	N/A	
	R6	Bedroom	W7 ↓	29.4	25.8	3.7	0.88	96%	95%	0.10	0.99	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W8 ↓	19.6	16.2	3.5	0.82	98%	96%	0.60	0.98	26	21	5	0.81	17	12	N/A	
	R8	Bedroom	W9 ↓	31.5	28.5	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	LKD	W10 ↓	21.6	18.8	2.8	0.87	97%	95%	0.50	0.98	27	24	3	0.89	17	14	N/A	
	R10	Bedroom	W11 ↓	33.8	31.4	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R11	LKD	W12 ←	10.1	8.7	1.4	0.86	58%	58%	0.12	0.99	10	10	0	1.00	6	6	N/A	
F08	R1	Bedroom	W1 →	34.9	3.9	31.0	0.11	98%	5%	9.96	0.05	North	North	N/A	N/A	North	North	N/A	
	R2	LKD	W2 ↓	24.6	18.2	6.4	0.74												
		LKD	W3 →	14.8	14.1	0.7	0.95	97%	96%	0.33	0.99	41	32	N/A	N/A	13	4	0.31	
	R3	Bedroom	W4 →	19.4	19.2	0.2	0.99	85%	85%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R4	Bedroom	W5 ↓	20.4	17.6	2.7	0.87	87%	86%	0.16	0.98	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	LKD	W6 ↓	17.7	14.5	3.2	0.82	97%	80%	4.54	0.83	20	18	2	0.90	14	12	N/A	
	R6	Bedroom	W7 ↓	30.5	27.7	N/A	N/A	97%	97%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W8 ↓	20.8	18.1	2.7	0.87	99%	99%	0.02	1.00	27	24	3	0.89	18	15	N/A	
	R8	Bedroom	W9 ↓	32.7	30.3	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	LKD	W10 ↓	22.6	20.5	2.1	0.91	97%	95%	0.50	0.98	28	26	N/A	N/A	18	16	N/A	
	R10	Bedroom	W11 ↓	34.6	32.8	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R11	LKD	W12 ←	10.8	9.5	1.3	0.88	63%	63%	0.06	1.00	10	10	0	1.00	6	6	N/A	
F09	R1	Bedroom	W1 →	35.8	6.5	29.3	0.18	98%	13%	9.60	0.13	North	North	N/A	N/A	North	North	N/A	
	R2	LKD	W2 ↓	26.1	21.5	4.6	0.82												
		LKD	W3 →	15.5	15.0	0.5	0.96	97%	96%	0.21	0.99	44	40	N/A	N/A	14	10	N/A	
	R3	Bedroom	W4 →	20.4	20.3	0.1	0.99	86%	86%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R4	LKD	W5 ↓	18.3	15.9	2.4	0.87	97%	87%	2.87	0.89	20	19	1	0.95	14	13	N/A	
	R5	Bedroom	W6 ↓	21.5	19.6	1.9	0.91	88%	87%	0.01	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R6	Bedroom	W7 ↓	32.0	29.9	N/A	N/A	97%	97%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W8 ↓	22.2	20.2	2.0	0.91	99%	99%	0.00	1.00	28	26	N/A	N/A	18	16	N/A	
	R8	Bedroom	W9 ↓	33.8	32.2	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	LKD	W10 ↓	23.7	22.1	1.6	0.93	97%	96%	0.46	0.98	31	31	N/A	N/A	21	21	N/A	
	R10	Bedroom	W11 ↓	35.3	34.0	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R11	LKD	W12 ←	13.6	12.3	1.2	0.91	66%	65%	0.07	1.00	10	10	0	1.00	6	6	N/A	
F10	R1	Bedroom	W1 →	36.6	13.6	23.0	0.37	98%	45%	8.29	0.46	North	North	N/A	N/A	North	North	N/A	
	R2	LKD	W2 ↓	28.4	24.6	3.8	0.87												
		LKD	W3 →	16.4	16.0	0.4	0.98	97%	97%	0.02	1.00	48	45	N/A	N/A	16	13	N/A	
	R3	Bedroom	W4 →	22.1	22.0	0.1	0.99	88%	88%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R4	LKD	W5 ↓	19.5	17.9	1.5	0.92	97%	96%	0.37	0.99	25	25	N/A	N/A	17	17	N/A	
	R5	Bedroom	W6 ↓	23.5	22.4	1.1	0.95	89%	89%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R6	Bedroom	W7 ↓	34.1	32.8	N/A	N/A	97%	97%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W8 ↓	23.6	22.4	1.3	0.95	99%	99%	0.00	1.00	32	32	N/A	N/A	22	22	N/A	
	R8	Bedroom	W9 ↓	35.1	34.1	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	LKD	W10 ↓	24.7	23.8	1.0	0.96	97%	97%	0.02	1.00	32	32	N/A	N/A	22	22	N/A	
	R10	Bedroom	W11 ↓	36.3	35.5	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R11	LKD	W12 ←	17.2	16.0	1.1	0.93	72%	72%	0.04	1.00	16	16	0	1.00	6	6	N/A	
F11	R1	Bedroom	W1 →	37.3	29.9	N/A	N/A	98%	90%	0.83	0.92	North	North	N/A	N/A	North	North	N/A	
	R2	LKD	W2 ↓	32.7	30.8	N/A	N/A												
		LKD	W3 →	31.6	31.4	N/A	N/A	100%	100%	0.00	1.00	65	65	N/A	N/A	21	21	N/A	
	R3	Bedroom	W4 →	24.7	24.6	0.1	1.00	94%	94%	0.00	1.00	North	North	N/A	N/A	North	North	N/A	
	R4	LKD	W5 ↓	26.0	25.2	0.8	0.97	99%	99%	0.00	1.00	37	37	N/A	N/A	23	23	N/A	
	R5	Bedroom	W6 ↓	27.5	26.8	0.7	0.98	95%	95%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R6	Bedroom	W7 ↓	36.4	35.7	N/A	N/A	97%	97%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W8 ↓	28.6	28.0	N/A	N/A	99%	99%	0.00	1.00	41	41	N/A	N/A	27	27	N/A	
	R8	Bedroom	W9 ↓	36.7	36.2	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	

Property, room & window attributes				VSC				NSL				APSH (room)							
Floor	Room	Room use	Window Ref./Orientation	Exis. (% VSC)	Prop. (% VSC)	Loss (% VSC)	Pro./Ex. ratio	Exis. (% rm)	Prop. (% rm)	Loss (m²)	Pro./Ex. ratio	Annual (%APSH)				Winter (%APSH)			
												Exis.	Prop.	Loss	Pro./Ex.	Exis.	Prop.	Pro./Ex.	
	R9	LKD	W10 ↓	29.2	28.6	N/A	N/A	97%	97%	0.00	1.00	40	40	N/A	N/A	26	26	N/A	
	R10	Bedroom	W11 ↓	37.5	37.1	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R11	LKD	W12 ←	33.6	32.9	N/A	N/A	98%	98%	0.02	1.00	32	32	N/A	N/A	7	7	N/A	
F12	R1	LKD	W1 ↓	39.1	38.9	N/A	N/A	99%	99%	0.00	1.00	63	63	N/A	N/A	28	28	N/A	
	R2	Bedroom	W2 ↓	39.1	38.9	N/A	N/A	96%	96%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R3	Bedroom	W3 ↓	39.2	39.1	N/A	N/A	97%	97%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R4	LKD	W4 ↓	39.2	39.0	N/A	N/A	99%	99%	0.00	1.00	64	64	N/A	N/A	28	28	N/A	
	R5	Bedroom	W5 ↓	39.2	39.1	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R6	LKD	W6 ↓	39.2	39.0	N/A	N/A	97%	97%	0.00	1.00	64	64	N/A	N/A	28	28	N/A	
	R7	Bedroom	W7 ↓	39.3	39.2	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
Garrard House																			
B01	R1	Bedroom	W1 ←	5.0	4.6	0.4	0.93	45%	40%	0.30	0.88	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R2	Bedroom	W2 ←	4.6	3.9	0.7	0.85	5%	5%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
F00	R1	LD	W1 ←	4.0	3.0	1.0	0.76	20%	18%	0.54	0.86	4	2	2	N/A*	1	0	N/A*	
	R2	Bedroom	W2 ←	4.2	3.2	1.0	0.76												
		Bedroom	W3 ↓	6.0	4.8	1.2	0.80	16%	16%	0.05	0.96	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
F01	R1	Living Room	W1 ←	3.6	3.1	0.6	0.85												
		Living Room	W2 ←	3.0	2.2	0.8	0.74												
		Living Room	W3 ←	3.5	2.5	1.0	0.71	27%	17%	2.98	0.65	0	0	0	N/A	0	0	N/A	
	R2	Living Room	W4 ←	3.4	2.3	1.1	0.68												
		Living Room	W5 ←	4.6	3.4	1.2	0.74												
		Living Room	W6 ↓	6.7	5.3	1.3	0.80	17%	13%	1.07	0.78	14	11	3	N/A*	5	3	N/A*	
F02	R1	Living Room	W1 ←	4.2	3.6	0.6	0.86												
		Living Room	W2 ←	3.4	2.7	0.7	0.79												
		Living Room	W3 ←	4.0	2.9	1.1	0.73	30%	20%	3.13	0.67	0	0	0	N/A	0	0	N/A	
	R2	Living Room	W4 ←	3.8	2.6	1.2	0.69												
		Living Room	W5 ←	5.1	3.9	1.2	0.77												
		Living Room	W6 ↓	7.8	6.2	1.6	0.80	17%	14%	0.92	0.82	13	10	3	N/A*	5	3	N/A*	
	R3	Living Room	W7 ↓	8.7	8.7	0.0	1.00	19%	19%	0.00	1.00	15	15	0	1.00	0	0	N/A	
	R4	Living Room	W8 ↓	12.1	12.1	0.0	1.00												
		Living Room	W9 ↓	11.3	11.3	0.1	0.99												
		Living Room	W10 ←	10.0	9.5	0.5	0.95	31%	30%	0.88	0.95	33	32	N/A	N/A	2	2	1.00	
	R5	Living Room	W11 ←	10.9	10.4	0.5	0.95												
		Living Room	W12 ←	11.4	10.9	0.6	0.95												
		Living Room	W13 ←	12.0	11.4	0.6	0.95	44%	41%	0.82	0.94	15	14	1	0.93	0	0	N/A	
	R6	Living Room	W14 ←	12.3	11.6	0.6	0.95												
		Living Room	W15 ←	12.4	11.7	0.7	0.95												
		Living Room	W16 ←	12.3	11.6	0.7	0.94												
		Living Room	W17 ←	11.9	11.1	0.7	0.94												
		Living Room	W18 ↓	3.2	2.8	0.4	0.89	51%	43%	2.45	0.84	15	12	3	0.80	2	0	N/A*	
F03	R1	Living Room	W1 ←	4.8	4.2	0.6	0.87												
		Living Room	W2 ←	4.0	3.2	0.8	0.80												
		Living Room	W3 ←	4.5	3.4	1.1	0.76	32%	23%	2.68	0.73	0	0	0	N/A	0	0	N/A	
	R2	Living Room	W4 ←	4.3	3.3	1.0	0.76												
		Living Room	W5 ←	5.8	4.6	1.2	0.79												
		Living Room	W6 ↓	14.3	12.7	1.6	0.89	17%	15%	0.71	0.86	25	23	2	0.92	11	9	N/A	
	R3	Living Room	W7 ↓	19.0	18.6	0.4	0.98	33%	33%	0.00	1.00	40	40	N/A	N/A	4	4	1.00	
	R4	Living Room	W8 ↓	18.6	17.9	0.7	0.96												
		Living Room	W9 ↓	17.1	16.2	0.9	0.95												
		Living Room	W10 ←	12.4	11.2	1.2	0.90	62%	50%	6.66	0.80	45	42	N/A	N/A	7	4	0.57	
	R5	Living Room	W11 ←	13.7	12.5	1.3	0.91												
		Living Room	W12 ←	14.4	13.0	1.3	0.91												
		Living Room	W13 ←	15.1	13.7	1.4	0.91	75%	53%	6.67	0.71	19	15	4	N/A*	3	0	N/A*	
	R6	Living Room	W14 ←	15.5	14.0	1.5	0.91												
		Living Room	W15 ←	15.6	14.1	1.5	0.90												
		Living Room	W16 ←	15.3	14.0	1.4	0.91												
		Living Room	W17 ←	14.4	13.3	1.1	0.92												
		Living Room	W18 ↓	4.3	3.9	0.4	0.90	78%	51%	8.41	0.65	19	15	4	N/A*	3	0	N/A*	
F04	R1	Bedroom	W1 ←	9.1	8.3	0.8	0.91	73%	73%	0.01	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R2	LKD	W2 ←	9.1	7.9	1.2	0.86												
		LKD	W3 ↓	25.9	24.3	1.7	0.94	93%	93%	0.11	1.00	61	59	N/A	N/A	14	12	N/A	
	R3	Bedroom	W4 ↓	25.1	23.6	1.5	0.94	95%	95%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	

Property, room & window attributes				VSC				NSL				APSH (room)							
Floor	Room	Room use	Window Ref./Orientation	Exis. (% VSC)	Prop. (% VSC)	Loss (% VSC)	Pro./Ex. ratio	Exis. (% rm)	Prop. (% rm)	Loss (m ²)	Pro./Ex. ratio	Annual (%APSH)				Winter (%APSH)			
												Exis.	Prop.	Loss	Pro./Ex.	Exis.	Prop.	Pro./Ex.	
	R4	Bedroom	W5 ↓	23.8	22.4	1.3	0.94	95%	95%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	LKD	W6 ↓	20.7	19.5	1.2	0.94	87%	82%	1.12	0.95	47	43	N/A	N/A	11	7	N/A	
	R6	Bedroom	W7 ←	12.9	11.6	1.3	0.90	66%	66%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
F05	R1	Bedroom	W1 ←	10.1	9.2	0.8	0.92	66%	66%	0.02	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R2	LKD	W2 ←	10.1	8.8	1.2	0.88												
		LKD	W3 ↓	28.5	26.7	1.8	0.94	95%	95%	0.12	1.00	65	63	N/A	N/A	16	14	N/A	
	R3	Bedroom	W4 ↓	27.8	26.3	1.6	0.94	100%	100%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R4	Bedroom	W5 ↓	26.6	25.3	1.4	0.95	99%	99%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	LKD	W6 ↓	23.3	22.1	1.2	0.95	92%	87%	1.24	0.95	50	47	N/A	N/A	14	11	N/A	
	R6	Bedroom	W7 ←	14.1	12.8	1.3	0.91	64%	64%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
F06	R1	Bedroom	W1 ←	13.4	12.3	1.1	0.92	78%	78%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R2	Bedroom	W2 ←	13.8	12.6	1.2	0.91												
		Bedroom	W3 ↓	29.9	28.3	N/A	N/A	100%	100%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R3	Bedroom	W4 ↓	29.8	28.5	N/A	N/A	99%	99%	0.01	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R4	LKD	W5 ↓	26.6	25.4	1.2	0.96	92%	87%	1.22	0.95	55	52	N/A	N/A	17	14	N/A	
	R5	Bedroom	W6 ←	15.8	14.6	1.2	0.92	64%	64%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
Projection West																			
F00	R1	Bedroom	W1 ←	8.9	8.5	0.4	0.95	25%	24%	0.08	0.97	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R2	LKD	W2 ←	1.3	1.2	0.1	0.93	5%	5%	0.00	1.00	2	2	0	1.00	1	1	1.00	
F01	R1	Bedroom	W1 ←	10.8	10.0	0.8	0.92	29%	27%	0.15	0.95	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R2	LKD	W2 ←	1.8	1.5	0.3	0.81												
		LKD	W3 ↙	13.3	13.1	0.2	0.99	23%	23%	0.00	1.00	19	19	0	1.00	6	6	N/A	
	R3	Bedroom	W4 ↙	13.4	13.3	0.1	0.99	49%	49%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R4	Bedroom	W5 ↙	12.7	12.6	0.1	0.99	49%	49%	0.01	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	Bedroom	W6 ←	11.9	11.7	0.2	0.98	44%	44%	0.02	0.99	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R6	Bedroom	W7 ←	11.5	11.3	0.2	0.98	31%	31%	0.02	0.99	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W8 ←	1.5	1.4	0.1	0.93	10%	10%	0.00	1.00	3	3	0	1.00	2	2	1.00	
	R8	Bedroom	W9 ←	11.7	11.5	0.2	0.99	25%	25%	0.02	0.99	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	LKD	W10 ←	11.2	10.8	0.4	0.97												
		LKD	W11 ←	2.6	2.3	0.3	0.90	26%	25%	0.10	0.98	9	9	0	1.00	0	0	N/A	
F02	R1	Bedroom	W1 ←	13.2	11.8	1.4	0.90	34%	31%	0.31	0.92	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R2	LKD	W2 ←	3.1	2.3	0.9	0.72												
		LKD	W3 ↙	16.1	15.8	0.3	0.98	26%	26%	0.00	1.00	23	23	0	1.00	6	6	N/A	
	R3	Bedroom	W4 ↙	16.2	15.9	0.4	0.98	61%	61%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R4	Bedroom	W5 ↙	15.6	15.0	0.5	0.96	62%	59%	0.17	0.96	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	Bedroom	W6 ←	14.5	13.7	0.9	0.94	51%	51%	0.04	0.99	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R6	Bedroom	W7 ←	14.2	13.4	0.9	0.94	37%	36%	0.05	0.99	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W8 ←	4.7	4.0	0.7	0.86	13%	13%	0.05	0.98	4	4	0	1.00	2	2	1.00	
	R8	Bedroom	W9 ←	14.5	13.8	0.8	0.95	33%	32%	0.11	0.97	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	LKD	W10 ←	13.9	13.0	0.9	0.93												
		LKD	W11 ←	5.4	4.7	0.7	0.87	35%	34%	0.30	0.97	14	14	0	1.00	2	2	1.00	
F03	R1	Bedroom	W1 ←	15.7	13.7	1.9	0.88	43%	36%	0.77	0.83	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R2	LKD	W2 ←	5.3	4.0	1.3	0.75												
		LKD	W3 ↙	19.5	18.6	0.9	0.95	30%	30%	0.00	1.00	34	31	N/A	N/A	11	11	N/A	
	R3	Bedroom	W4 ↙	19.6	18.5	1.1	0.94	74%	74%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R4	Bedroom	W5 ↙	18.8	17.5	1.4	0.93	80%	72%	0.59	0.90	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	Bedroom	W6 ←	17.7	15.8	1.9	0.89	67%	61%	0.51	0.91	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R6	Bedroom	W7 ←	17.5	15.6	1.9	0.89	49%	44%	0.61	0.89	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W8 ←	8.2	6.6	1.6	0.80	20%	20%	0.07	0.98	11	11	0	1.00	4	4	1.00	
	R8	Bedroom	W9 ←	18.2	16.5	1.7	0.91	46%	42%	0.45	0.91	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	LKD	W10 ←	16.6	15.1	1.6	0.91												
		LKD	W11 ←	8.9	7.5	1.4	0.85	47%	43%	1.00	0.92	19	19	0	1.00	4	4	1.00	
F04	R1	Bedroom	W1 ←	18.6	15.8	2.8	0.85	59%	43%	1.69	0.73	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R2	LKD	W2 ←	8.5	6.6	1.9	0.78												
		LKD	W3 ↙	23.5	21.5	2.1	0.91	41%	41%	0.02	1.00	40	36	N/A	N/A	13	13	N/A	
	R3	Bedroom	W4 ↙	23.3	21.1	2.2	0.90	92%	91%	0.09	0.99	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R4	Bedroom	W5 ↙	22.3	20.0	2.3	0.90	98%	83%	1.06	0.85	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	Bedroom	W6 ←	20.7	17.7	2.9	0.86	91%	69%	1.76	0.76	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R6	Bedroom	W7 ←	20.6	17.8	2.8	0.86	71%	50%	2.27	0.70	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W8 ←	11.9	9.4	2.4	0.80	36%	31%	1.13	0.86	18	15	3	0.83	7	7	N/A	
	R8	Bedroom	W9 ←	21.6	19.2	2.4	0.89	67%	49%	1.99	0.74	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	LKD	W10 ←	19.8	17.4	2.4	0.88												

Property, room & window attributes				VSC				NSL				APSH (room)							
Floor	Room	Room use	Window Ref./Orientation	Exis. (% VSC)	Prop. (% VSC)	Loss (% VSC)	Pro./Ex. ratio	Exis. (% rm)	Prop. (% rm)	Loss (m ²)	Pro./Ex. ratio	Annual (%APSH)				Winter (%APSH)			
		LKD	W11 ←	12.7	10.6	2.1	0.83	74%	64%	2.58	0.86	27	23	4	0.85	6	6	N/A	
F05	R1	Bedroom	W1 ←	22.0	18.1	3.9	0.82	69%	50%	2.03	0.73	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R2	LKD	W2 ←	11.9	8.8	3.1	0.74												
		LKD	W3 ↙	26.9	23.5	3.5	0.87	61%	56%	1.65	0.92	48	42	N/A	N/A	17	17	N/A	
	R3	Bedroom	W4 ↙	25.8	22.3	3.5	0.86	94%	92%	0.21	0.97	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R4	Bedroom	W5 ↙	25.1	21.7	3.4	0.86	99%	86%	0.91	0.87	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	Bedroom	W6 ←	23.7	19.7	4.1	0.83	92%	77%	1.20	0.84	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R6	Bedroom	W7 ←	24.4	20.4	3.9	0.84	86%	57%	3.07	0.67	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W8 ←	15.3	12.0	3.4	0.78	74%	39%	7.55	0.53	22	18	4	0.82	9	9	N/A	
	R8	Bedroom	W9 ←	25.2	21.9	3.3	0.87	87%	55%	3.65	0.63	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	LKD	W10 ←	23.9	20.8	3.1	0.87												
		LKD	W11 ←	16.4	13.5	3.0	0.82	99%	87%	2.97	0.88	33	29	N/A	N/A	11	10	N/A	
F06	R1	Bedroom	W1 ←	24.4	19.4	5.0	0.80	76%	59%	1.80	0.78	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R2	LKD	W2 ←	15.8	11.2	4.6	0.71												
		LKD	W3 ↙	19.3	15.0	4.3	0.78	81%	60%	7.06	0.74	34	25	N/A	N/A	18	14	N/A	
	R3	Bedroom	W4 ↙	12.8	9.4	3.4	0.74	91%	87%	0.32	0.95	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R4	Bedroom	W5 ↙	24.0	20.5	3.5	0.85	90%	83%	0.53	0.92	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	Bedroom	W6 ←	27.1	22.3	4.8	0.82	95%	85%	0.84	0.89	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R6	Bedroom	W7 ←	27.1	22.4	4.7	0.83	89%	64%	2.88	0.72	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W8 ←	18.6	15.0	3.6	0.81	93%	44%	10.80	0.47	24	17	7	0.71	11	10	N/A	
	R8	Bedroom	W9 ←	27.7	23.5	4.2	0.85	91%	64%	3.52	0.70	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	LKD	W10 ←	28.1	24.5	3.7	0.87												
		LKD	W11 ←	30.6	26.8	3.7	0.88	99%	91%	1.89	0.92	40	37	N/A	N/A	13	12	N/A	
F07	R1	Bedroom	W1 ←	27.7	23.0	4.7	0.83	88%	75%	1.40	0.85	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R2	LKD	W2 ←	18.0	13.6	4.4	0.76												
		LKD	W3 ↙	35.0	30.1	N/A	N/A	82%	61%	6.86	0.74	54	47	N/A	N/A	22	19	N/A	
	R3	Bedroom	W4 ↙	34.3	29.8	N/A	N/A	95%	92%	0.18	0.98	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R4	Bedroom	W5 ↙	32.1	28.0	N/A	N/A	100%	94%	0.38	0.95	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	Bedroom	W6 ←	30.2	25.6	4.6	0.85	97%	92%	0.42	0.95	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R6	Bedroom	W7 ←	30.8	26.2	4.6	0.85	93%	71%	2.61	0.76	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W8 ←	21.5	17.8	3.7	0.83	95%	49%	10.25	0.51	27	22	5	0.81	13	11	N/A	
	R8	Bedroom	W9 ←	31.3	26.9	4.4	0.86	96%	71%	3.38	0.74	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	LKD	W10 ←	30.8	27.0	N/A	N/A												
		LKD	W11 ↙	25.0	22.6	2.4	0.90	99%	94%	1.11	0.95	49	45	N/A	N/A	23	21	N/A	
F08	R1	Bedroom	W1 ←	29.0	24.9	4.1	0.86	95%	87%	0.79	0.92	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R2	LKD	W2 ←	30.2	25.5	4.6	0.85												
		LKD	W3 ↙	35.5	31.3	N/A	N/A	83%	62%	6.72	0.75	56	50	N/A	N/A	23	20	N/A	
	R3	Bedroom	W4 ↙	35.5	31.5	N/A	N/A	93%	92%	0.12	0.98	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R4	Bedroom	W5 ↙	34.0	30.4	N/A	N/A	98%	98%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R5	Bedroom	W6 ←	32.0	27.9	N/A	N/A	96%	96%	0.00	1.00	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R6	Bedroom	W7 ←	32.5	28.4	N/A	N/A	97%	78%	2.02	0.81	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R7	LKD	W8 ←	33.3	29.1	N/A	N/A	98%	57%	8.83	0.58	39	35	N/A	N/A	14	12	N/A	
	R8	Bedroom	W9 ←	33.3	29.3	N/A	N/A	99%	80%	2.11	0.81	N/R	N/R	N/R	N/R	N/R	N/R	N/R	
	R9	LKD	W10 ←	31.9	28.4	N/A	N/A												
		LKD	W11 ↙	30.2	27.9	N/A	N/A	99%	99%	0.00	1.00	54	51	N/A	N/A	24	24	N/A	
125 Friar St																			
F01	R1	LKD	W1 ↑	21.7	16.7	5.0	0.77												
		LKD	W2 ↑	22.5	17.6	4.9	0.78												
		LKD	W3 ↑	21.4	16.0	5.4	0.75												
		LKD	W4 ↑	22.2	16.9	5.3	0.76												
		LKD	W5 ↑	22.5	17.5	5.0	0.78												
		LKD	W6 ↑	23.3	18.4	4.9	0.79												
		LKD	W7 ↑	22.3	17.9	4.4	0.80												
		LKD	W8 ↑	23.1	18.8	4.3	0.81												
		LKD	W9 ↖	20.5	17.0	3.5	0.83												
		LKD	W10 ↖	21.3	17.8	3.5	0.84												
		LKD	W11 ↑	21.2	16.9	4.3	0.80												
		LKD	W12 ↑	22.0	17.7	4.3	0.80	98%	90%	1.91	0.92	North	North	N/A	N/A	North	North	N/A	
F02	R1	LKD	W1 ↑	24.1	19.5	4.6	0.81												
		LKD	W2 ↑	24.8	20.4	4.4	0.82												
		LKD	W3 ↑	23.6	18.6	5.0	0.79												
		LKD	W4 ↑	24.2	19.5	4.7	0.80												

Property, room & window attributes				VSC				NSL				APSH (room)							
Floor	Room	Room use	Window Ref./Orientation	Exis. (% VSC)	Prop. (% VSC)	Loss (% VSC)	Pro./Ex. ratio	Exis. (% rm)	Prop. (% rm)	Loss (m²)	Pro./Ex. ratio	Annual (%APSH)				Winter (%APSH)			
		LKD	W5 ↑	24.8	20.4	4.4	0.82												
		LKD	W6 ↑	25.5	20.3	5.2	0.80												
		LKD	W7 ↑	24.6	19.9	4.7	0.81												
		LKD	W8 ↑	25.3	20.8	4.5	0.82												
		LKD	W9 ↖	22.8	19.0	3.8	0.83												
		LKD	W10 ↖	23.5	19.9	3.6	0.85												
		LKD	W11 ↑	23.5	18.9	4.6	0.80												
		LKD	W12 ↑	24.3	19.8	4.5	0.81	94%	87%	1.63	0.92	North	North	N/A	N/A	North	North	N/A	
F03	R2	LKD	W1 ↑	26.6	21.9	4.7	0.82												
		LKD	W2 ↑	26.8	22.6	4.2	0.84												
		LKD	W3 ↑	26.2	22.1	4.0	0.85	85%	68%	3.29	0.80	North	North	N/A	N/A	North	North	N/A	