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Daylight and Sunlight Report

14th February, 2022



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1.0 Introduction

1.1 CHP Surveyors Limited have been instructed by Lousada Plc to consider the level of daylight and sunlight the proposed accommodation will be able to enjoy.

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1.2 The GPDO states that the developer must apply to the local planning authority for prior approval as to ensure that all habitable rooms within the new development will achieve adequate natural light (A.2. (1) (f)), and the impact on the amenity of the existing building and neighbouring premises including overlooking, privacy and loss of light (A.2. (1) (g)).

2.0 Executive Summary

2.1 CHP Surveyors Limited's instructions are to assess the levels of daylight and sunlight enjoyed by the proposed accommodation.

2.2 To ensure that this assessment has correctly considered the daylight and sunlight within the proposed accommodation, it has been undertaken in accordance with the Building Research Establishment's publication "*Site Layout Planning for Daylight and Sunlight. A Guide to Good Practice.*" (2011) (the "BRE guidelines").

2.3 The technical analysis has been undertaken using the standards and tests contained in the BRE guidelines. A summary of the recommendations can be found in the Principles of Daylight and Sunlight attached at Appendix A.

2.4 The results of our analysis with regard to the daylight and sunlight taking into account the vegetation on the neighbouring properties, along the northern boundary, demonstrates that the aims of the Building Research Establishments publication "*Site Layout Planning for Daylight and Sunlight A guide to good practice*" are achieved and the proposed accommodation will have good access to daylight and sunlight.



3.0 Assessment

- 3.1 The GPDO states that when considering an application, it needs to show that all habitable rooms within the new development will have adequate natural light and the impact of the amenity of the existing building and neighbouring premises including overlooking, privacy and loss of light.

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- 3.2 The Ministry of Housing, Communities & Local Government have produced a document, National Planning Policy Framework dated July 2021.

Within the document, under paragraph 125 of the National Planning Policy Framework, it states with regard to daylight and sunlight that consideration should be given as to whether efficient use of the land is being made: -

..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 adequate living standards).

It also states under the National Planning Practice guidance under Design (March 2014):

....with regard to scale and relates to both the overall size and mass of individual buildings and spaces in relation to their surroundings, and to the scale of their parts. As part of this account should be taken of local climatic conditions, including daylight and sunlight...

- 3.3 To ensure that the assessment has been considered appropriately, daylight and sunlight assessments have been undertaken referencing the criteria contained in the Building Research Establishment's publication "*Site Layout Planning for Daylight and Sunlight. A Guide to Good Practice.*" (2011) (BRE guidelines) but taking into account the specific site constraints.

3.4 The introduction to the BRE guidelines state that: -

“The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and this document should not be seen as an instrument of planning policy. Its aim is to help rather than constrain the developer.”

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Although it gives numerical guidelines, these should be interpreted flexibly because natural lighting is only one of the many factors in site layout design.”

3.5 Within the BRE guidelines, there are different methodologies for calculating daylight. The first method calculates the Vertical Sky Component (VSC). This analysis establishes the amount of available daylight received directly from the sky for each individual window. The reference point for this analysis is the centre point of the window.

3.6 The second method is the No Sky Line (NSL) or Daylight Distribution analysis. This assesses the change in position of the No Sky Line between the existing and proposed situations. It does not take into account the number and size of windows to a room.

3.7 An alternative method of considering the implications of the proposals on the neighbouring properties daylight is to undertake an Average Daylight Factor (ADF) analysis in accordance with Appendix C of the BRE guidelines. This takes into account the area of the glazing serving the room as well as the size of the room and expresses the ratio of daylight within the room as a portion of the daylight outside. The BRE guidelines set out the minimum level as being dependent on the room use. The criteria state the minimum levels are as follows: -

- Kitchen – 2%
- Living Room – 1.5%
- Bedroom – 1%

3.8 To calculate the level of sunlight received, the BRE guidelines state that an analysis is required to windows which are within 90° of due south. An Annual Probable Sunlight Hours (APSH) test is undertaken which establishes the level of sunlight achieved during the winter and summer months.



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- 3.9 An extended account of the BRE guidelines is attached at Appendix A, entitled 'Principles of Daylight and Sunlight'.

4.0 Information

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- 4.1 During the process of producing our report, we have made reference to the following information: -

Dusek Design Associates

Drawing numbers: 1235-P3-1B, 1235-P3-2A, 1235-P3-3A

Compass Surveys Limited

Drawing numbers: 1158-01E, 01FP

Accucity

3D contextual model

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Information obtained from site visit

5.0 Proposals

- 5.1 The existing property is a redundant sports pavilion, and the proposal is to convert this to a single two-bedroom residence.

6.0 Limitations

- 6.1 Our 3D computer model and resultant analyses of the proposed development has been based on the drawings set out in Clause 4.1 provided by Dusek Design Associates.



7.0 Methodology

7.1 Based on the 3D contextual model and following our site visit we have produced a 3D computer model of the neighbouring structures that could restrict access to daylight and sunlight to the proposed accommodation, including the vegetation surrounding the proposals.

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7.2 Using a specialist computer programme, we have undertaken an analysis in accordance with the criteria contained in the BRE guidelines. We have run an analysis to establish whether the proposed accommodation will have good access to daylight and sunlight.

7.3 As clearly stated within the BRE guidelines; *“Its aims are to help designers not constrain them and that therefore the numerical values contained within the document should be interpreted flexibly since natural light is only one of many factors in site layout design.”* It also states that different target levels may be used in such an urban location, as we are considering.

8.0 Daylight Assessment

8.1 General

8.1.1 It is recognised within the BRE guidelines that any proposed residential accommodation should receive adequate daylight. To establish whether adequate levels of daylight will be achieved within any new residential accommodation, an Average Daylight Factor (ADF) analysis is undertaken. This takes into account the area of the glazing serving the room as well as the size of the room and expresses the ratio of daylight within the room as a portion of the daylight outside. The BRE guidelines set out the minimum level as being dependent on the room use. The criteria state the minimum levels are as follows:

- Kitchen – 2%
- Living Room – 1.5%
- Bedroom – 1%

8.1.2 The BRE guidelines state that *“living rooms and kitchens need more daylight than bedrooms”*.



- 8.1.3** To take into consideration the vegetation that exists around the site, when considering daylight, we have undertaken our analysis in accordance with Appendix H of the BRE guidelines. This requires the analysis to be undertaken in summer (full leaf) and if necessary, in winter (bare branch) using the appropriate transparencies for the tree's species. Paragraph H2.8 of the BRE guidelines makes reference to BS8206-02 and states that if the ADF is exceeded in summer, then daylight would be appropriate. Where the ADF is exceeded in the winter but not in the summer, the daylight provision year-round is likely to be adequate, but the trees are having some effect on daylight.

8.2 Daylight Analysis

- 8.2.1** An ADF analysis, taking into account the surrounding vegetation, has been undertaken with results of the analysis are set out in the table attached at Appendix C and the corresponding room map being drawing number 2601-100 which is attached at Appendix B.
- 8.2.2** The results of the analysis undertaken with the trees in full leaf demonstrates that in all instances the recommended minimum level of ADF will be achieved. The analysis therefore demonstrates, in accordance with Appendix H of the BRE guidelines, that the proposed accommodation will have good access to daylight.

9.0 Sunlight Assessment

9.1 General

- 9.1.1** Concerning sunlight, the BRE guidelines advise that all rooms with windows within 90° of due south should achieve 25% of the Annual Probable Sunlight Hours (APSH) with at least 5% during the winter months.
- 9.1.2** To take into consideration the vegetation that exists around the site, we have undertaken the sunlight analysis in accordance with Appendix H of the BRE guidelines. The analysis has therefore analysed the levels of sunlight enjoyed with no vegetation and with the vegetation considered opaque. The levels of sunlight have then been calculated using the equations set out in paragraphs H3.2 and H3.3 of the BRE guidelines.



9.2 Sunlight Assessment

9.2.1 The results of the analysis are set out in the table attached at Appendix E. These demonstrate that in all instances, that the main living area and the two bedrooms will all achieve an APSH in excess of 25%, with in excess of 5% achieved during the winter months.

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9.2.2 The analysis therefore demonstrates, in accordance with Appendix H of the BRE guidelines, that the proposed accommodation will have good access to sunlight.

10.0 Conclusion

10.1 An analysis has been undertaken in accordance with the Building Research Establishment's publication "*Site Layout Planning for Daylight and Sunlight. A Guide to Good Practice*". (BRE guidelines) to establish whether the proposed accommodation will enjoy adequate levels of daylight and sunlight.

10.2 Concerning daylight, due to the vegetation/trees surrounding the site, an analysis has been undertaken in accordance with Appendix H of the BRE guidelines. The results of the daylight and sunlight analysis with the trees demonstrates that in all instances the numerical values set out in the BRE guidelines are exceeded.

10.3 To conclude, the analysis undertaken demonstrates that the proposed accommodation will achieve the requirements set out in the Building Research Establishments publication "*Site Layout Planning for Daylight and Sunlight. A Guide to Good Practice*." And the proposed accommodation will have good access to daylight and sunlight.



Appendix A

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PRINCIPLES OF DAYLIGHT AND SUNLIGHT

In 2011 the Building Research Establishment (BRE) published a handbook titled “*Site Layout Planning for Daylight and Sunlight. A Guide to Good Practice.*” Its aim was to provide advice to building designers on site layout planning in order to achieve good daylight and sunlight amenity to the proposed development, the open spaces between the proposed blocks and the existing surrounding properties.

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The content of this guide is well established and is used by most Local Authorities as the methodology for measuring daylight and sunlight, the guidelines should be applied flexibly to take account of the specific circumstances of each site. The BRE guidelines are suited more to low density suburban development sites where there is greater flexibility for site layout planning. In dense urban development sites, these are usually constrained often by adjacent buildings and the guidelines state that these should be applied more flexibly in these instances. Within the Introduction of the guidelines, it states that: -

“The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and this document should not be seen as an instrument of planning policy. Its aim is to help rather than constrain the developer. Although it gives numerical guidelines, these should be interpreted flexibly because natural light is only one of many factors in site layout design.”

The Introduction of this document, continues to advise that its purpose is also to; “*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.*”

It must therefore be appreciated and as can be seen from the above extracts; the handbook is for guidance only.

Daylight

The guidelines state that daylight assessments should be undertaken to habitable rooms where the occupants can expect to receive a reasonable amount of daylight.

The first assessment that should be undertaken is to establish whether the proposals will subtend an angle of 25° from the centre of the window. If it does not, then it is considered there will be good daylight. The BRE guidelines advise: -



“If any part of a new building or extension, measured in a vertical section perpendicular to a main window wall of an existing building, from the centre of a lowest window, subtends an angle of more than 25° to the horizontal may be affected.”

This assessment is most appropriate for well-spaced, low density or low rise, uniform proposed developments. It is not an appropriate assessment for dense urban environments where the existing building on the development site already subtends at an angle greater than 25° to the horizontal from the subject window. It is for this reason that this 25° assessment is generally dispensed with and the more detailed analysis outlined below is undertaken.

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The BRE guidelines set out two methods for calculating daylight, these being an analysis of the Vertical Sky Component (VSC) and No Sky Line (NSL).

Vertical Sky Component (VSC)

The Vertical Sky Component (VSC) analysis establishes the amount of available daylight received directly from the sky for each individual window. The reference point for the analysis being the centre of the window, on the plan of the outer window wall.

The VSC is the amount of direct sky a window enjoys, expressed as a percentage of the amount of direct sky a horizontal, unobstructed rooflight would receive.

The maximum percentage of direct skylight a vertical window can receive is 40%. The BRE have determined that where a VSC of 27% is achieved, then daylight should reach the window of an existing building.

Where a VSC of less than 27% is achieved either enjoyed before the implementation of the proposals or it is enjoyed following the implementation, then the BRE guidelines state that provided the new value is greater than 0.8 times the existing value, daylight will not be significantly affected.

No Sky Line (NSL)

The daylight distribution analysis is undertaken at working plane level, with this set at 0.85m above the floor level of a dwelling.

The BRE guidelines state that provided a significant area of the room, which is considered to be 80%, is in front of the No Sky Line (the point behind which at desk top level no sky is visible) or at least 0.8 times the existing area, then the room will enjoy good distribution.



If, in the existing situation this is not the case, the BRE guidelines state that provided the area following the implementation of the proposals is at least 0.8 times the existing area, there will not be a significant affect.

Average Daylight Factor (ADF)

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This analysis is more detailed and therefore is more precise in its measurement of daylight. Not only does it consider the amount of sky visible but also the window size, room use and room size.

The BRE guidelines provides set criteria for calculating the Average Daylight Factor for specific room uses within a property.

- Kitchen – 2%
- Living Room – 1.5%
- Bedroom – 1%

Sunlight

This analysis is undertaken in a similar method to calculating VSC. Within residential accommodation the analysis undertaken to establish the levels of sunlight relate to the main windows that are within 90° of due south. It is considered that sunlight to kitchens and bedrooms is less important, although care should be taken not to block out too much.

Within commercial or non-domestic buildings, the use of the building will determine whether a sunlight assessment is required.

In relation to neighbouring residential buildings, if a window is facing within 90° of due south and overlooking any part of the proposals subtends an angle of more than 25° to the horizontal measured from the centre of the window in a vertical section perpendicular to the window, then the sunlight of the existing dwelling may be affected.

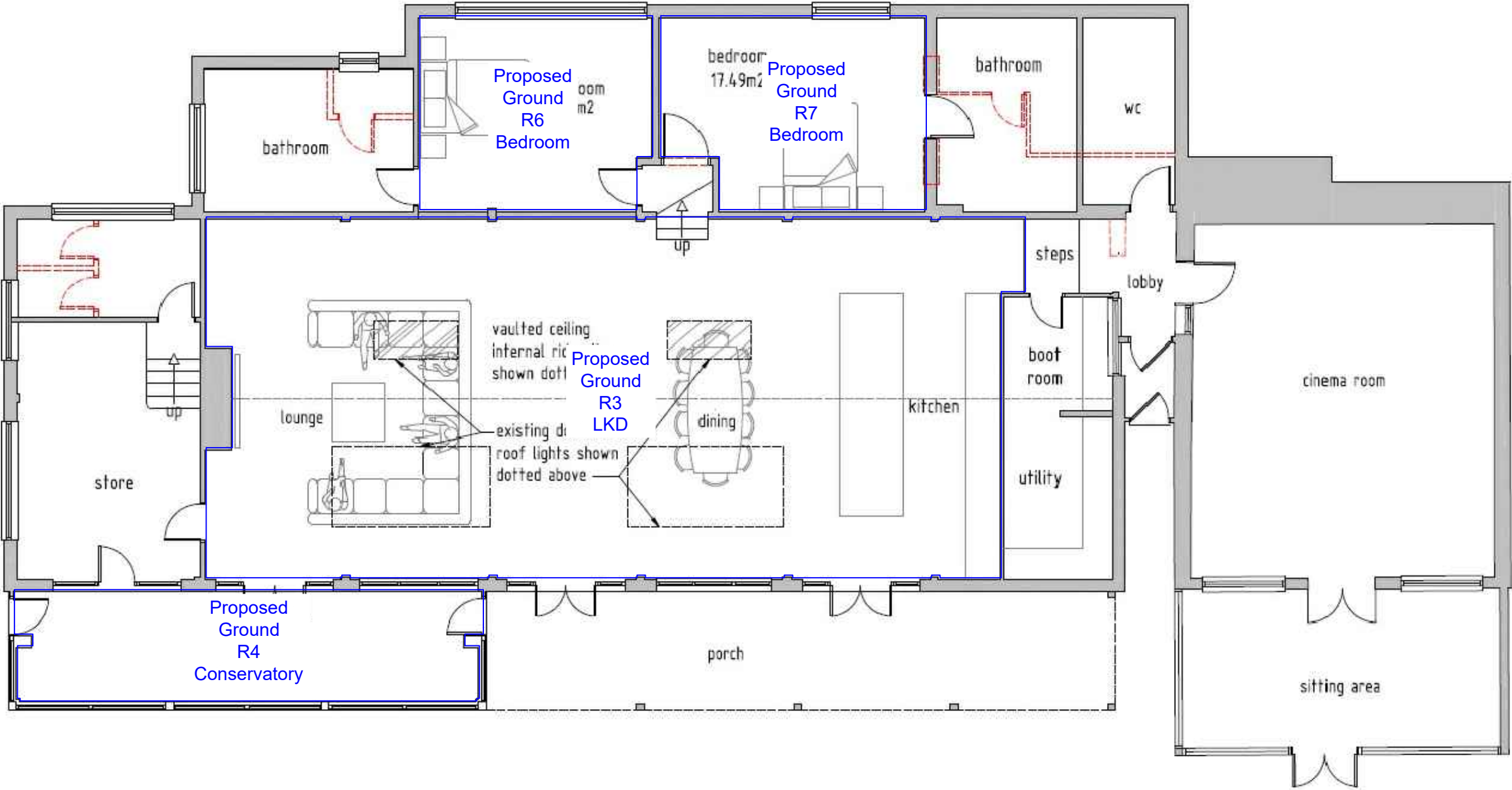
Annual Probable Sunlight Hours (APSH)

The 'Probable Sunlight Hours' can be defined as the total number of hours in the year that sun is expected to shine.



Appendix B

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Proposed Accommodation - Daylight Results

LEVEL	ROOM	ROOM USE	REQUIRED ADF	PROPOSED ADF
Ground	R3	Living/Kitchen/Dining Room	1.5	2.1
	R4	Living Room	1.5	11.1
	R6	Bedroom	1.0	3.1
	R7	Bedroom	1.0	1.2



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LEVEL	ROOM	ROOM USE	WINTER APSH (%)	TOTAL APSH (%)
Ground	R3	Living/Kitchen/Dining Room	23%	87%
	R4	Living Room	5%	42%
	R6	Bedroom	23%	46%
	R7	Bedroom	20%	45%