

SOLAR AND DAYLIGHT ACCESS STUDY JORDAN SPRINGS

SOLAR AND DAYLIGHT ACCESS STUDY – DEVELOPMENT APPLICATION
NOVEMBER 2019

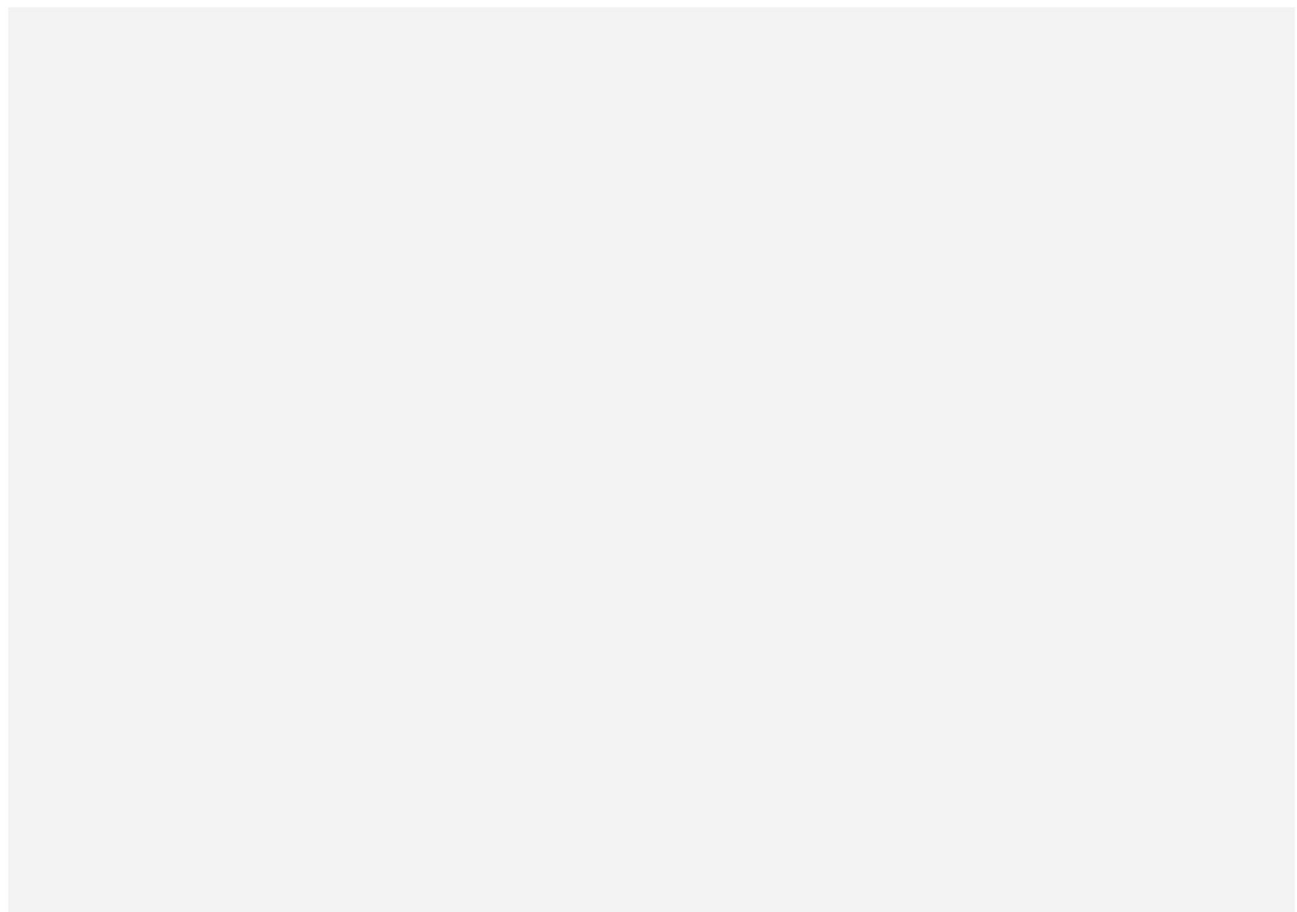


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Executive Summary

This report has been prepared in response to the Department of Planning's submission regarding the Jordan Springs Retirement Living development. It provides additional explanatory information regarding performance against the Apartment Design Guide 4A Solar and Daylight Access design criteria.

The total development achieves reasonable solar access for a site located within the density of the Sydney Metropolitan Area with excellent daylight access due to the highly transparent glazing.

Analysis undertaken confirms that 60% of apartments across the development receive 2 hours of direct sunlight between 9am and 3pm for living rooms and private open spaces on the winter solstice. This is extended to 63% when considering a timeframe of 8am to 3pm.

35% of apartments receive no direct sunlight during the 9am – 3pm on the winter solstice. This is reduced to 32% between 8am and 3pm. Given the occupation patterns by the population of these retirement residences is different to that of other apartments, it is reasonable to extend the period of time for this assessment.



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1.0 Introduction

This report supports the Jordan Springs Planning Approval Submission for Lot 1, DP1248137.

1.1 Site Location

Jordan Springs is located 57km north-west of Sydney's CBD, and approximately 7km from Penrith's CBD. Nestled between St Marys and Penrith, Jordan Springs is in close proximity to major landmarks including Wianamatta Regional Park, Penrith Leagues Club, Nepean River, Penrith Westfield and the Sydney International Regatta Centre.

The Jordan Springs Retirement Living development comprises of three 6-story apartment buildings – Building A, Building B and Building C. The DA site is located on land generally known and identified as Lot 1, DP1248137 on Jordan Springs Boulevard, Jordan Springs 2747.

1.2 Overview of Proposed Development

The Jordan Springs Retirement Living development seeks approval for the construction and use of three 6-storey residential flat buildings, comprising of 139 apartments and ground floor community centre (within Building A), the allocation of car parking, services, plant and storage within the common basement and the construction of ancillary landscaping.

1.3 Purpose of this Report

The Jordan Springs Retirement Living development has been studied in relation to the SEPP65 solar and daylight access guidance associated with apartments. The 'Design Criteria' included in the Apartment Design Guide (July 2015) relevant to this guidance recommends that:

- *Living rooms and private open spaces of at least 70% of apartments in a building receive a minimum of 2 hours direct sunlight between 9am and 3pm at mid-winter.*
- *A maximum of 15% of apartments in a building receive no direct sunlight between 9 am and 3 pm at mid-winter.*

2.0 Methodology

The Jordan Springs Retirement Living development consists of three 6-story apartment buildings, with shared basement facilities. This study has analysed the solar access to a number of floors which provide representative results for every apartment within the development.

Solar access varies by level given the site context of the project. Each level with a different apartment mix and/or receiving different solar access due to the site context has been analysed. While only typical floors are modelled, these are sufficient to confirm solar access to all apartments given that they are representative of all floors and apartments within the project. The table below summarises the floors modelled together with the floors that they represent. While the modelled floors are representative, the lower floor is always taken as the modelled floor to ensure that the analysis can be considered conservative

Modelled Floor	Representative Floors
Building A – Floor 1	Building A – Floors 1, 2, 3
Building A – Floor 4	Building A – Floors 4, 5
Building B – Ground Floor	Building B – Ground Floor
Building B – Floor 1	Building B – Floors 1, 2, 3
Building B – Floor 4	Building B – Floors 4, 5
Building C – Ground Floor	Building C – Ground Floor
Building C – Floor 1	Building C – Floors 1, 2, 3
Building C – Floor 4	Building C – Floors 4, 5

The Rhino software with the Grasshopper plug-in was used to visually determine solar access in 15-minute time steps. Direct sunlight to the living rooms and private open spaces was determined at finished floor level. Mid-winter has been interpreted as being the winter solstice, June 21st, which provides conservative results as it is the shortest day of the year. Two timeframes were used for the assessment: 9am-3pm to align with the ADG criteria and 8am-3pm as considered representative of the retirement living building population. Given the occupation patterns by the population of these retirement residences is different to that of other apartments, it is reasonable to extend the period of time for this assessment.

The modelled apartments have been based on the latest drawings – rev 1 of the Preliminary Architectural drawing set for the development.

3.0 Results

The results presented in the tables below have been presented for the Jordan Springs Retirement Living development against the Apartment Design Guide criteria. These results represent all three 6-story buildings that are part of the development – Building A, Building B and Building C.

3.1 Apartments Results

Table 1: Solar access greater than 2 hours for Building A, Building B and Building C on 21 June

	9am – 3pm		8am – 3pm	
	%	No. of Apartments	%	No. of Apartments
Building A - Living Rooms and Private Open Spaces ¹	100%	36	100%	36
Building B - Living Rooms and Private Open Spaces ¹	46%	24	46%	24
Building C - Living Rooms and Private Open Spaces ¹	47%	24	55%	28
Development Total	60%	84	63%	88

¹ Results indicate the percentage of apartments receiving as least 2 hours of solar access in the living rooms and balconies/wintergardens.

Table 2: Apartments receiving no direct solar access in Building A, Building B and Building on 21 June

	9am – 3pm		8am – 3pm	
	%	No. of Apartments	%	No. of Apartments
Building A - Living Rooms and Private Open Spaces ²	0%	0	0%	0
Building B - Living Rooms and Private Open Spaces ²	50%	26	44%	23
Building C - Living Rooms and Private Open Spaces ²	43%	22	43%	22
Development Total	35%	48	32%	45

² Results indicate the percentage of apartments receiving no direct solar access in the living rooms, and/or balconies/wintergardens. Apartments must receive direct sunlight to greater than 1m² of living space to be counted.

4.0 Discussion

The main factors leading to 63% solar access for the apartments for the 8am to 3pm criteria include:

- Predominant North-South orientation of buildings
- Single aspect orientation for a number of apartments
- Cross-through apartments with North-facing main bedrooms

Solar access to Buildings B and C in general is constrained by the siting of the development along the southern edge of the precinct and the proximity to the BAL exclusion zone. Which gives very little opportunity to re-orient the buildings. However, given its location, further large-scale development in close proximity that would further overshadow the development is highly unlikely to occur in the future.

The Apartment Design Guide design criteria is about both Solar and Daylight Access to habitable rooms and private open space, but not bedroom specifically bedroom zones. The cross-through apartments in Buildings B & C receive direct sun for the 2 hours but this is focused in the bedroom areas. The Retirement Living demographic often uses bedrooms as alternative/secondary Living and study areas. These apartments have not been included in the total.

While 63% of apartments receive the minimum of 2 hours direct sun to living rooms and private open spaces, this is believed to be further enhanced by the following building attributes that enhance daylight and views:

- **High Light Transmission Glazing** – The glazing has been selected to have high light transmittance.
- **Daylight versus Sunlight** – The Apartment Design Guide quantifies a recommended amount of direct sunlight access, which does not fully characterise daylight (diffuse natural light) access. The Jordan Springs ILAs are positioned with parkland to the South and lake to the East, therefore the access to diffuse natural light to apartments will be high.
- **Outlook** – The extensive views to the nature reserve to the South are prioritised and the through apartments give the occupant access to direct sunlight on the Northern side of the dwelling.

These considerations mean that the Jordan Springs ILA living areas, open space and bedrooms will experience higher daylight levels year-round than many other residential buildings of a similar scale. Therefore, we believe the proposed Jordan Springs development exceeds the intent of SEPP65's Daylight Access principle.

5.0 Conclusion

The intent of the Apartment Design Guide 4A Solar and daylight access criteria is achieved for the Jordan Springs development through optimisation of the orientation and aspect of the buildings and use of a high-performance façade. Jordan Springs achieves 63% of apartments receiving 2 hours of direct solar access between 8am and 3pm for living rooms and private open spaces on the winter solstice. With 32% of apartments receiving no direct sunlight during this same period.

Appendix A: Daylight Penetration Diagrams

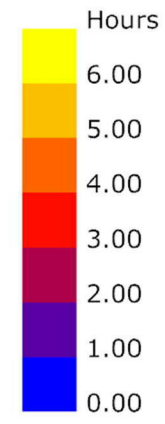
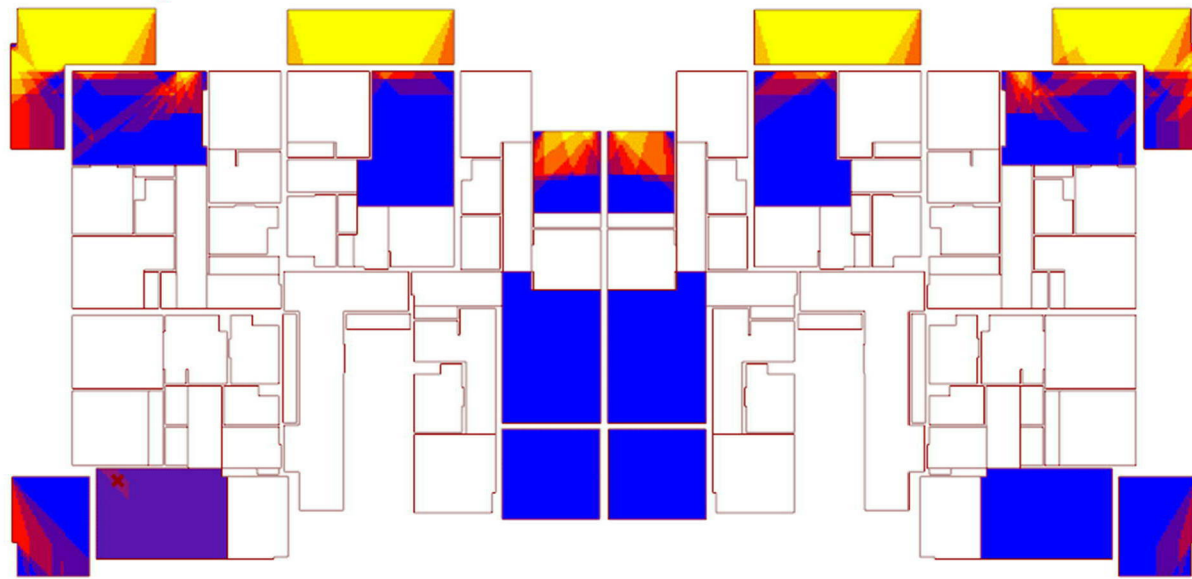
To further demonstrate solar access to the apartments, daylight penetration diagrams are provided below. These daylight penetration diagrams have been modelled on the following typical floor plates:

- Building A - Level 01
- Building A - Level 04
- Building B – Ground Level
- Building B – Level 01
- Building B – Level 04
- Building C – Ground Level
- Building C – Level 01
- Building C – Level 04

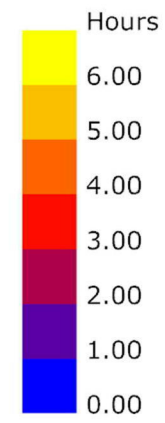
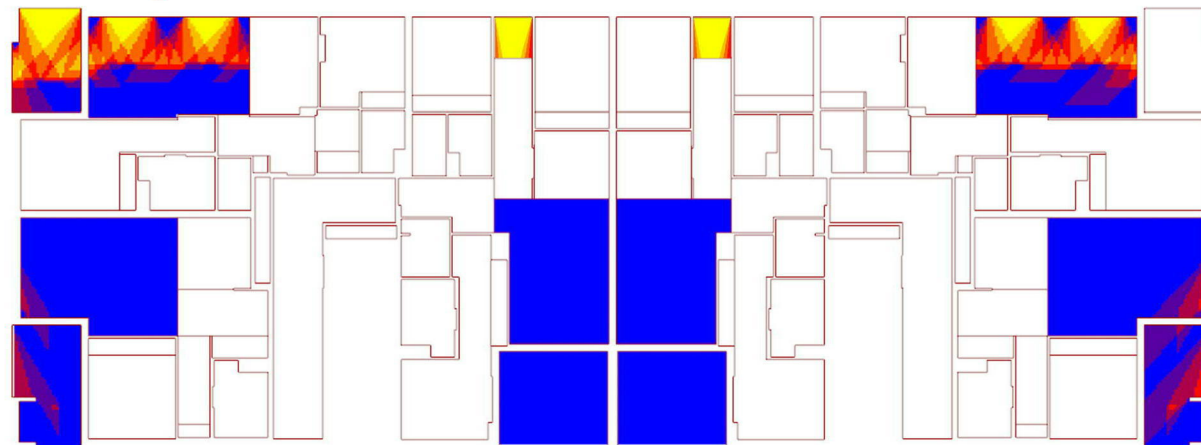
These diagrams show the direct sunlight on the apartment floor plates during the hours of daylight. It is important to note that these diagrams do not illustrate the daylight level that will be experienced due to the high light transmission facade and unobstructed views, which increase the overall amenity in the apartments.

- Living and balcony areas are highlighted.
- Areas receiving sunlight are shaded ranging from yellow to purple to represent the number of hours as per the legend.

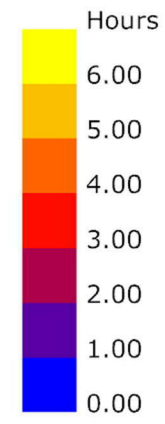
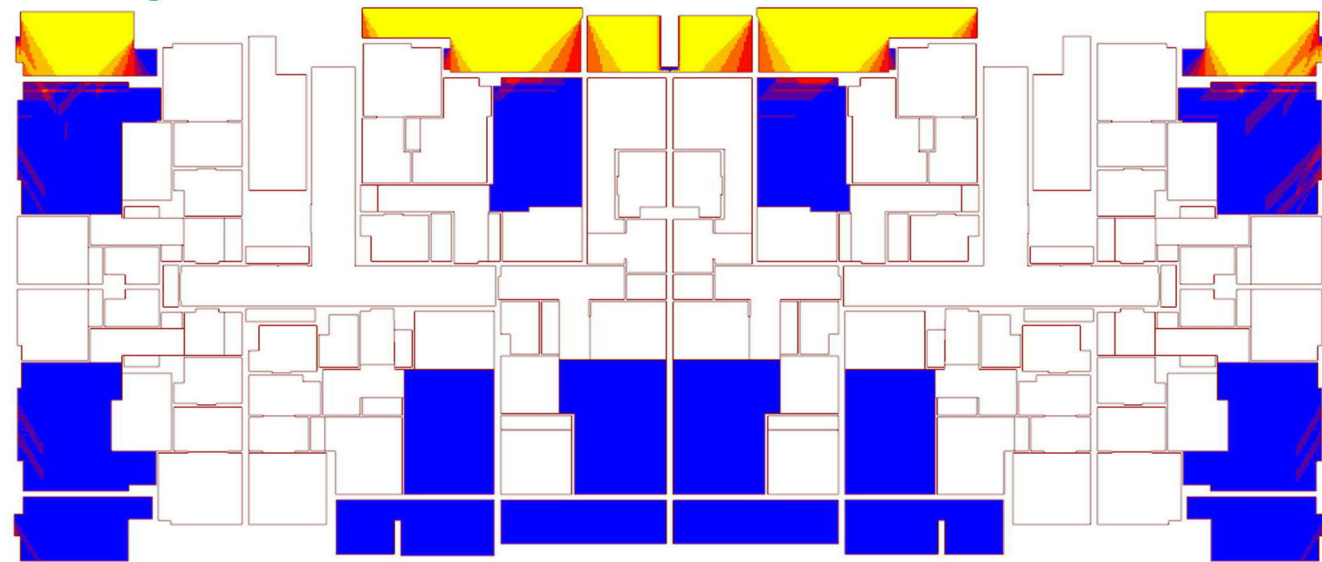
Building A – Level 01



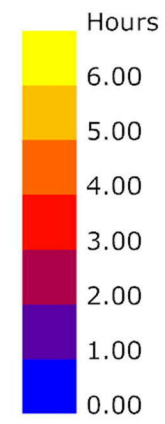
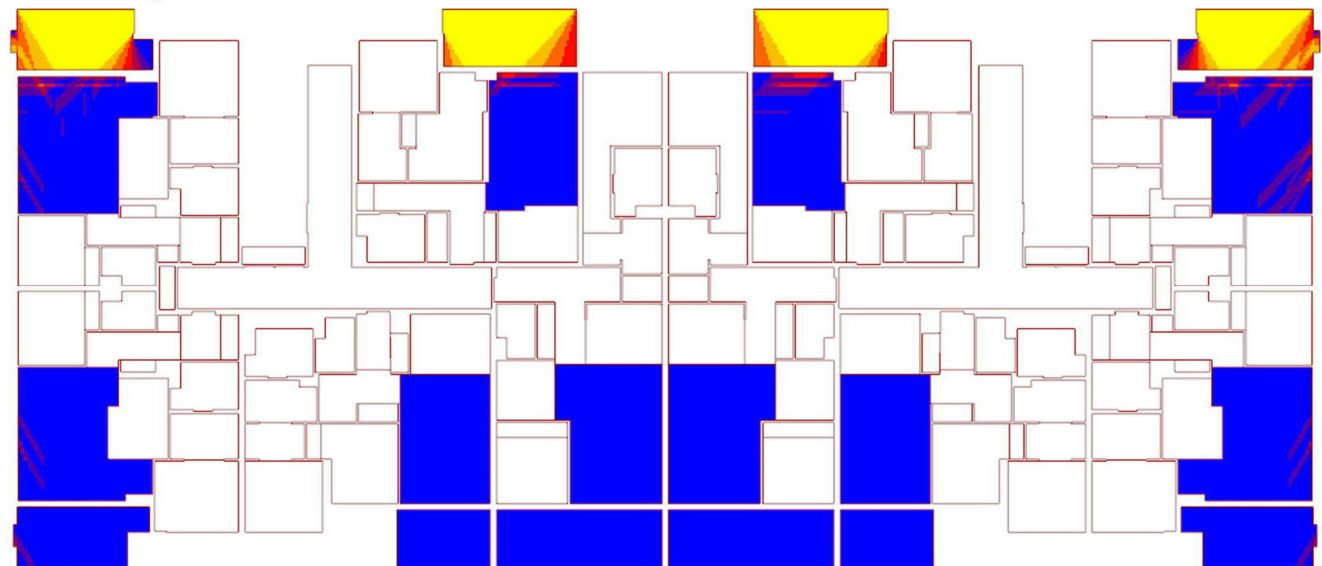
Building A – Level 04



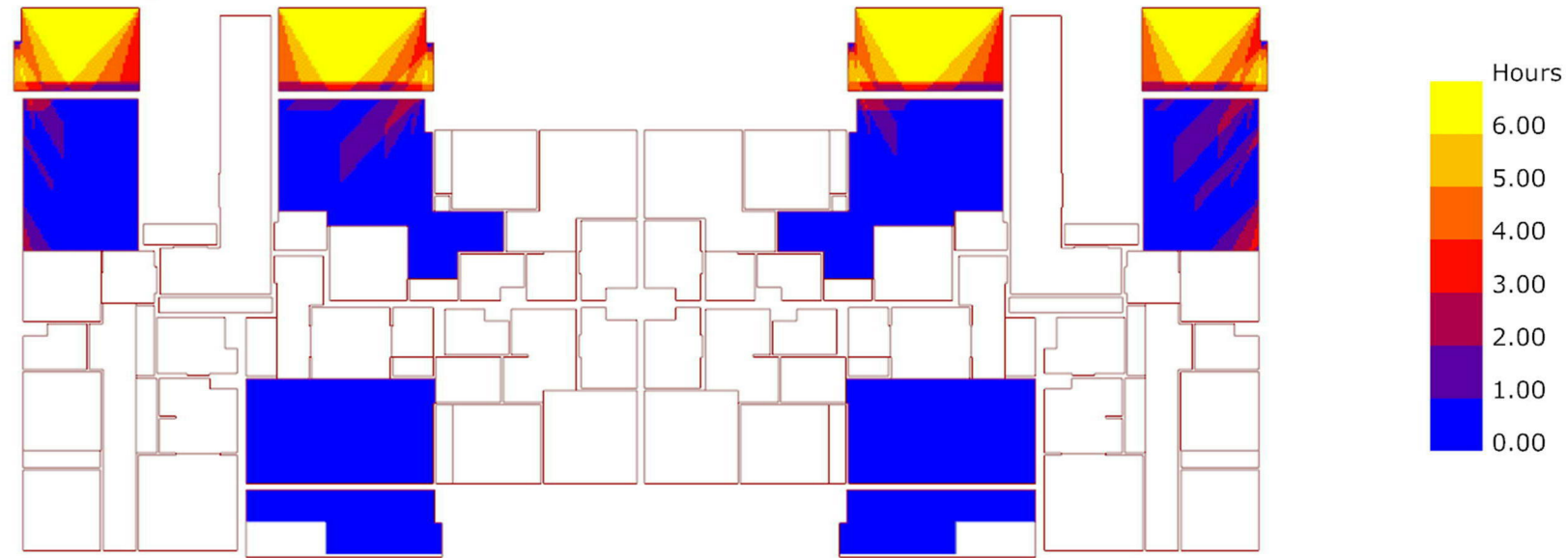
Building B – Ground Level



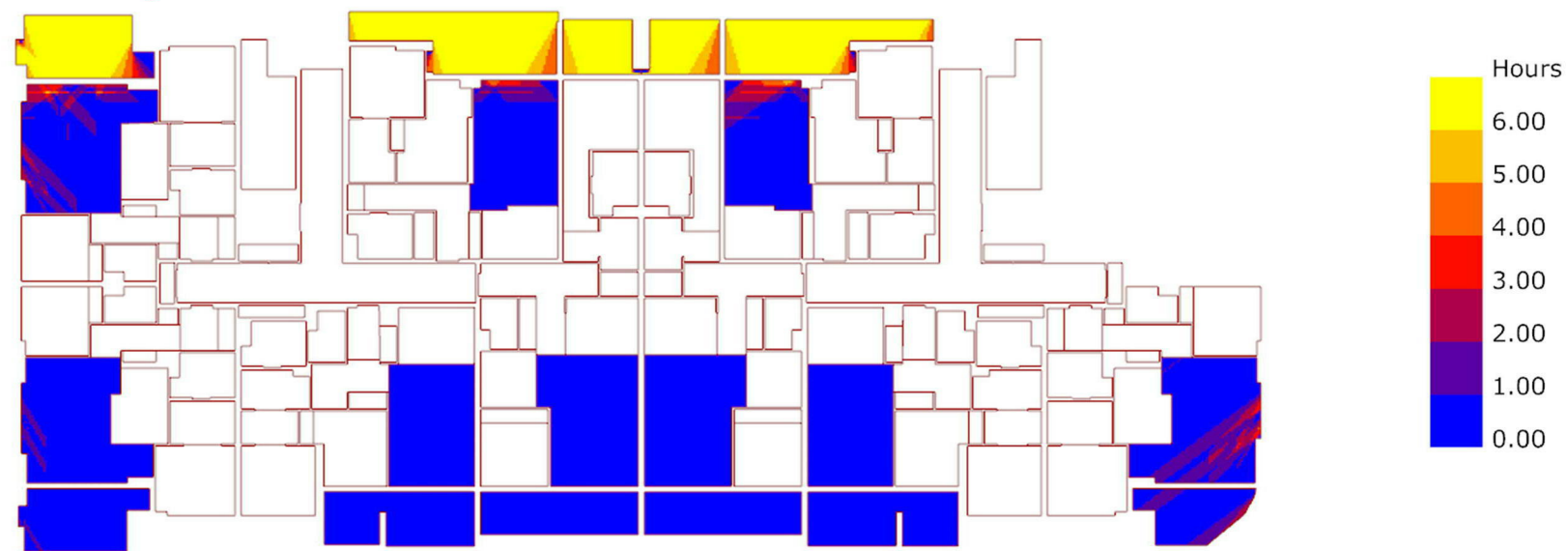
Building B – Level 01



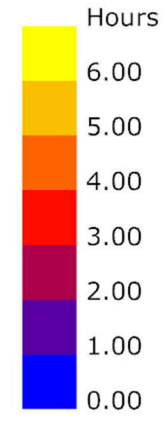
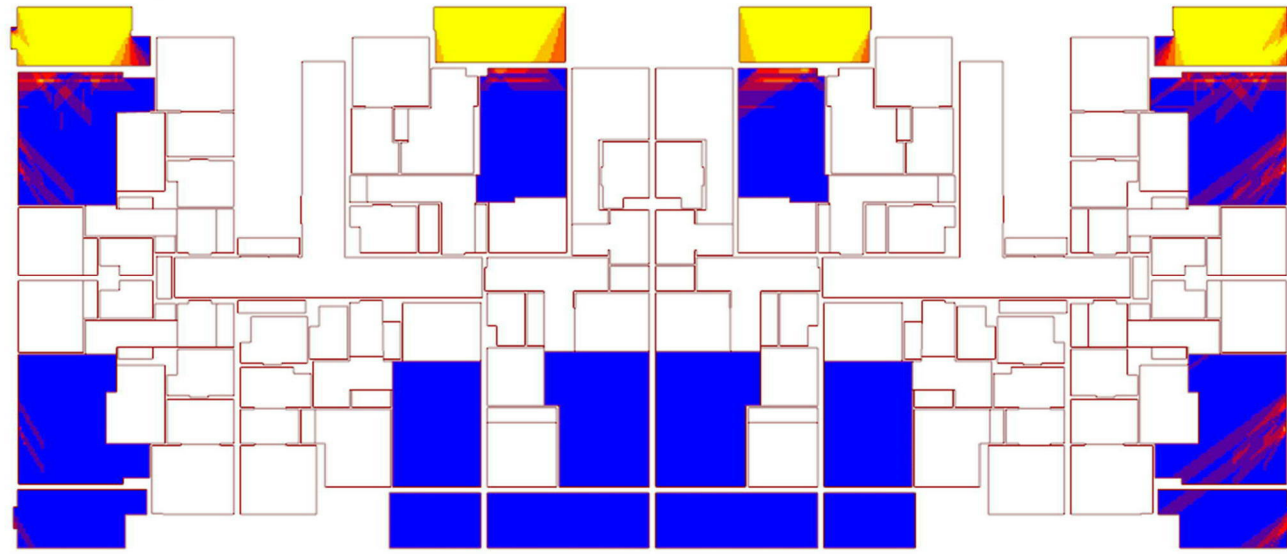
Building B – Level 04



Building C – Ground Level



Building C – Level 01



Building C – Level 04

