



MEMORANDUM

DATE:	July 26, 2021	RWDI REFERENCE #: 1904405
TO:	Angela Kavanagh	Email: angela.kavanagh@mirvac.com
FROM:	Kevin Peddie	Email: kevin.peddie@rwdi.com
	Michael Pieterse	michael.pieterse@rwdi.com
RE:	Solar Access – Comparison of DA Scheme and Proposed Design Changes Waterloo Metro Quarter – Building 2	

Dear Angela,

Since submission of the Development Application for the Residential Building 2 of the Waterloo Metro Quarter development, changes have been made to several unit types to increase the amount of solar access to Living Rooms and Private Open Spaces (POS). While the ADG does not require two hours of solar access to areas of 1 m² or greater, the development team has responded to the comments provided by Walsh Analysis on behalf of DPIE to increase the amount of time where this metric is achieved within the limits imposed by the site (e.g., at 1:00 PM on the winter solstice there is a 1.61° sliver of sunlight able to be harnessed on the western façade, while strict overshadowing metrics onto Alexandria Park limit changes to the southeast corner).

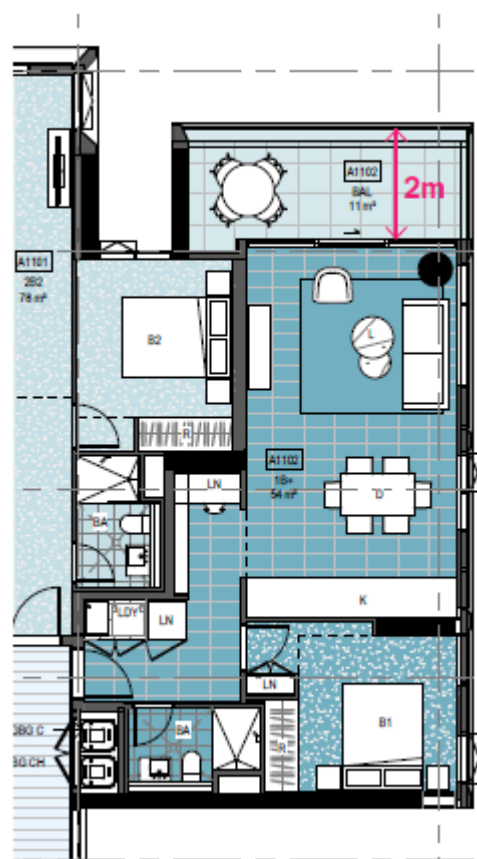
This technical memo should be read in conjunction with RWDI's technical memo dated April 23, 2021, which provides a response to model accuracy and methodology, as well as interpretation of the ADG solar area requirement. The following sections provide a brief overview of the changes made to the design and provides a comparison of the areas of solar access at various times for the DA Scheme and for the Design Change to demonstrate the improvement in the affected units based on Solar Access modelling undertaken by RWDI for the DA Scheme (as submitted with the Development Application) and with the proposed design changes.

Southeast Apartments

With consideration for the limitations of overshadowing to Alexandria Park as well as required balcony depths, the balustrade and glazing line of the southeast apartment on Levels 3 to 21 has shifted to the east, while the southeast column has been relocated to be within the apartment. These changes can be noted in the below comparative plans.



DA Scheme



Proposed Design Changes

Summary of Findings

- With the adjustments in the glazing and balustrade, solar access to 1m² to the living room glazing was predicted to improve by 10 minutes compared to the DA Scheme. The area of sunlight which lands on the glazing surface has also increased as noted in the following table.
- The living room windows are now predicted to receive more than 1 m² of direct sunlight for 1 hour and 40 minutes between 9:00 am and 10:40 am on the winter solstice.

Unit 1102

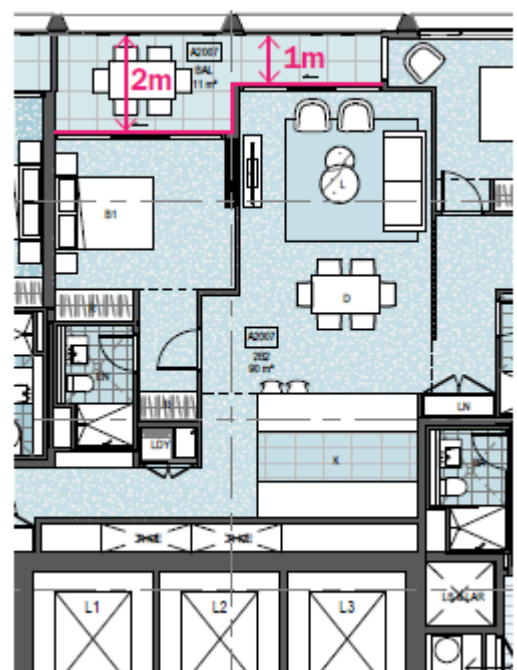
	Solar Amenity (m ²)			
	DA Scheme		Proposed Design Change	
	Living Room	POS	Living Room	POS
8:00 am	1 +	1 +	1 +	1 +
8:30 am	1 +	1 +	1 +	1 +
9:00 am	1 +	1 +	1 +	1 +
9:30 am	1 +	1 +	1 +	1 +
10:00 am	1 +	1 +	1 +	1 +
10:30 am	1.0	1 +	1 +	1 +
10:35 am	0.76	1 +	1 +	1 +
10:40 am	0.62	1 +	1.04	1 +
10:45 am	0.46	1 +	0.77	1 +
10:50 am	0.31	1 +	0.58	1 +
10:55 am	0.12	1 +	0.39	1 +
11:00 am	0.01	1 +	0.17	1 +

East High-Rise Apartments

The living room glazing of the units on Levels 20 and 21 has shifted 1 m east in this reconfiguration as shown in the below comparative plans.



DA Scheme



Proposed Design Changes



Summary of Findings

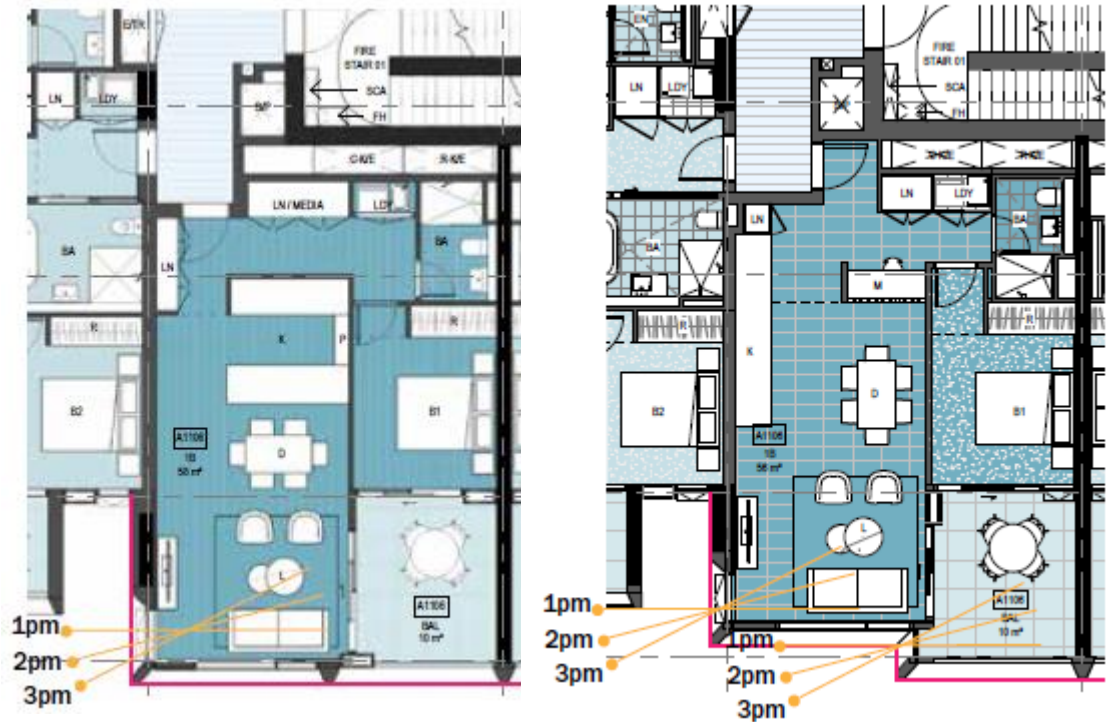
- In the DA Scheme, the POS of the east-facing 2-bedroom apartments on Levels 20 and 21 were predicted to comply with ADG solar access requirement while the living room was predicted to achieve 1 m² of direct sunlight for 1 hour and 20 minutes between 9:00 am and 10:20 am on the winter solstice.
- With the living room glazing shifted east by 1m, the living room windows were predicted to receive more than 1 m² of direct sunlight for 2 hours between 9:00 am and 11:00 am on the winter solstice.

Unit 2007 presented below as an example

	Solar Amenity (m ²)			
	DA Scheme		Proposed Design Change	
	Living Room	POS	Living Room	POS
8:00 am	1 +	1 +	1 +	1 +
8:30 am	1 +	1 +	1 +	1 +
9:00 am	1 +	1 +	1 +	1 +
9:30 am	1 +	1 +	1 +	1 +
10:00 am	1 +	1 +	1 +	1 +
10:20 am	1 +	1 +	1 +	1 +
10:25 am	0.93	1 +	1 +	1 +
10:30 am	0.78	1 +	1 +	1 +
10:35 am	0.63	1 +	1 +	1 +
10:40 am	0.51	1 +	1 +	1 +
10:45 am	0.36	1 +	1 +	1 +
10:50 am	0.18	1 +	1 +	1 +
10:55 am	No solar access	1 +	1 +	1 +
11:00 am	No solar access	1 +	1 +	1 +

West Apartments

The living room façade on Levels 3 to 19 has shifted 700 mm east in this re-configuration to provide an opportunity for the northern sun to penetrate into the POS as indicated below.



DA Scheme

Proposed Design Changes

Summary of Findings

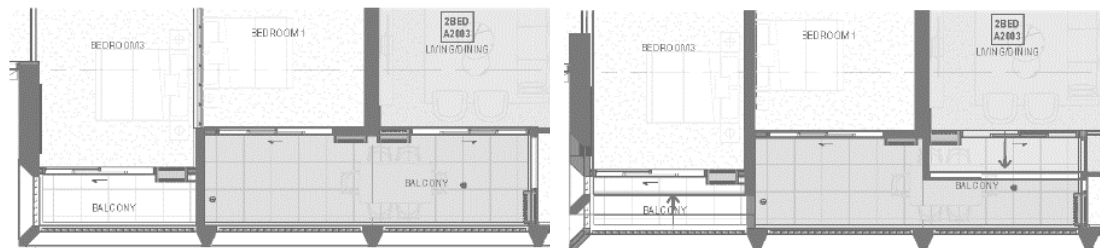
- In the DA Scheme, the living room of the west-facing 1-bedroom apartment was predicted to comply with ADG solar access requirement while the POS was predicted to achieve 1 m² of direct sunlight for 10 minutes between 2:50 pm and 3:00 pm on the winter solstice.
- With the proposed design change, the living room and POS were both predicted to achieve 1 m² of solar access for 1 hour and 50 minutes on the winter solstice. This was a balance between solar access to both areas. The POS will also now receive direct sunlight for more than 2hrs, while direct sunlight was only achieved in the DA Scheme from 1:45pm.
- It is noted that the reduction in massing of Building 1 of the development increases the number of floors to which there is any area of solar access at 1:00 pm by two.

Unit 1106 presented below as an example

	Solar Amenity (m ²)			
	DA Scheme		Proposed Design Change	
	Living Room	POS	Living Room	POS
1:00 pm	1 +	No solar access	0.77	0.82
1:05 pm	1 +	No solar access	0.89	0.88
1:10 pm	1 +	No solar access	1 +	1 +
1:15 pm	1 +	No solar access	1 +	1 +
1:20 pm	1 +	No solar access	1 +	1 +
1:25 pm	1 +	No solar access	1 +	1 +
1:30 pm	1 +	No solar access	1 +	1 +
1:45 pm	1 +	0.03	1 +	1 +
2:00 pm	1 +	0.19	1 +	1 +
2:30 pm	1 +	0.68	1 +	1 +
2:50 pm	1 +	1 +	1 +	1 +
2:55 pm	1 +	1 +	1 +	1 +
3:00 pm	1 +	1 +	1 +	1 +

West High-Rise Apartments

The changes to the west high-rise units on levels 20 and 21 mirror those of the east high-rise units with a shift of the living room glazing by 1 m to the west as indicated in the comparative plans below.



DA Scheme

Proposed Scheme



Summary of Findings

- In the previous scheme, the living room of the high-rise west apartment was predicted to achieve 1 m² of direct sunlight for 15 minutes between 2:45 pm and 3:00 pm on the winter solstice, while the POS was predicted for 1 hour and 5 minutes between 1:55 pm and 3:00 pm (for unit 2003).
- With the proposed design change, taking unit 2003 as an example, the living room and POS were predicted to achieve 1 m² of solar access for increased time periods of 50 minutes and 1 hour and 50 minutes respectively. Level 21 achieves slightly more sunlight due to the increased floor to floor height as well as there being no levels above which overshadow.

Unit 2003

	Solar Amenity (m ²)			
	DA Scheme		Proposed Design Change	
	Living Room	POS	Living Room	POS
1:00 pm	No solar access	No solar access	No solar access	0.79
1:05 pm	No solar access	No solar access	No solar access	0.83
1:10 pm	No solar access	No solar access	No solar access	1 +
1:30 pm	No solar access	0.09	No solar access	1 +
1:35 pm	No solar access	0.26	No solar access	1 +
1:40 pm	No solar access	0.42	No solar access	1 +
1:45 pm	No solar access	0.69	No solar access	1 +
1:50 pm	No solar access	0.99	No solar access	1 +
1:55 pm	No solar access	1 +	0.06	1 +
2:00 pm	No solar access	1 +	0.52	1 +
2:05 pm	No solar access	1 +	0.87	1 +
2:10 pm	No solar access	1 +	1 +	1 +
2:30 pm	0.08	1 +	1 +	1 +
2:35 pm	0.34	1 +	1 +	1 +
2:40 pm	0.71	1 +	1 +	1 +
2:45 pm	1 +	1 +	1 +	1 +
3:00 pm	1 +	1 +	1 +	1 +



Unit 2103

	Solar Amenity (m ²)			
	DA Scheme		Proposed Design Change	
	Living Room	POS	Living Room	POS
1:00 pm	No solar access	No solar access	No solar access	0.81
1:05 pm	No solar access	No solar access	No solar access	1 +
1:25 pm	No solar access	0.004	No solar access	1 +
1:30 pm	No solar access	0.11	No solar access	1 +
1:35 pm	No solar access	0.30	No solar access	1 +
1:40 pm	No solar access	0.53	No solar access	1 +
1:45 pm	No solar access	0.82	No solar access	1 +
1:50 pm	No solar access	1 +	No solar access	1 +
1:55 pm	No solar access	1 +	0.36	1 +
2:00 pm	No solar access	1 +	0.92	1 +
2:05 pm	No solar access	1 +	1 +	1 +
2:25 pm	0.05	1 +	1 +	1 +
2:30 pm	0.25	1 +	1 +	1 +
2:35 pm	0.57	1 +	1 +	1 +
2:40 pm	0.98	1 +	1 +	1 +
2:45 pm	1 +	1 +	1 +	1 +
3:00 pm	1 +	1 +	1 +	1 +

Conclusion

The proposed design changes have increased the period of time which these apartments will achieve direct solar access and the amount of time that 1 m² of solar access is achieved for several living rooms and private open spaces of the development. It is noted that the apartments in the south-eastern corner as well as the western aspects will achieve some level of direct sunlight for at least 2 hours to both the living areas and POS. The western units benefit both from the change in form as well as the reduction in Building 1 massing which has enabled solar access on levels 6 and 7.

Compared to the DA Scheme, the Proposed Design Changes result in the following additional units meeting ADG requirements for Solar Access to living space windows and private open space:

- East high-rise Units 2007 and 2107 (2 additional units); and,
- West units 606 to 1906 (14 additional units).

In addition to the 85 of 150 units (57%) identified as meeting the ADG requirements for the DA Scheme, this brings the total number of compliant units to 101 of 150 (66%).

Four additional units (606, 607, 2007 and 2107) now meet requirements for living space, increasing the number from 97 with the DA design to 101 (67%). The number of



compliant private open spaces increases from 89 (59%) to 105 (70%) with the addition of the west units 606 to 1906 and west high-rise units 2003 and 2103.

As shown in the tables of this memorandum, when an area threshold is applied:

- Southeast units have a minimum of 1 m² of solar amenity for an additional 10 minutes to 10:40 am;
- East high-rise units now have two hours with a minimum of 1 m² of solar amenity;
- West units have increased from ten minutes to one hour and 50 minutes with a minimum of 1 m² of solar amenity (from 1:10 pm to 3:00 pm); and,
- West high-rise units gain an additional 35-40 minutes with 1 m².