



MEMORANDUM

DATE:	April 23, 2021	RWDI REFERENCE #: 1904405
TO:	Annie Leung	Acting Director, Key Sites Assessments - DPIE
FROM:	Kevin Peddie	Email: kevin.peddie@rwdi.com
	Michael Pieterse	michael.pieterse@rwdi.com
RE:	Solar Access – Peer Review Response Waterloo Metro Quarter – Building 2 and 4	

Dear Annie,

It is understood that after submission of the planning documents for the Waterloo Metro Quarter development, a peer review has been undertaken by Walsh Analysis on behalf of the DPIE on the Solar Access Study for the residential buildings (Building 2 and 4). The comments noted in the peer review are discussed below, with response to items raised discussed in this memo.

It is understood that the peer review has been undertaken based on a visual inspection by Walsh Analysis and that no modelling has been undertaken.

Peer Review Comments

North Point and Model Accuracy

The peer review notes that the model used for the solar access analysis is suitable to be used for the solar access analysis, including surrounding context and alignment.

A check has been done between the survey and the overshadow planes to determine alignment, noting a less than 0.5 degrees difference.

RWDI Comment *No further comment on the model review required.*

The comment regarding the alignment of the true north for the solar analysis is important and was significantly reviewed by the design team as this can have implications in the overshadowing and solar access results. It is important to note that the use of maps such as the cadastral maps, LIDAR and survey drawings require alignment to solar north, as noted in the meta-data of these map which can require a correction of 0.95 degrees. This has been accounted for in the analysis.



Methodology

The peer review states that a period of between 8am and 4pm has been used for the solar access study instead of between 9am and 3pm. Reference is made to a Land & Environment court case where an extension of time has been considered appropriate, noting that this extension should not be applicable in this case.

RWDI Comment *A clarification is noted with regards to the time period used for the assessment. In Section 8 of Solar Access report, the results are presented between the hours of 9am and 3pm. For Building 2 it is noted that an extension of time of 30 minutes (until 3:30pm) will enable 80% of apartments to achieve access to sunlight for BOTH the living space windows and Private Outdoor Areas.*

The reference made to the Land & Environment Court Case notes in Item 86 that the RFDC (which this noted case was designed under) should not be read as a development standard or a requirement that must be complied with. Commissioner Brown goes on to refer to the rules of thumb section of the RFDC whereby minimum standards may vary depending on local context issues and/or if the development applicants are able to demonstrate that they have addressed the better design practice guidelines and achieved the stated objectives. The better design practices have been presented in the response by Hassell. It is also noted in this court case that a 2hr extension was required to achieve the 70% requirement, while in the case for Building 2, a 30 minute extension resulted in a 23% increase to 80% compliance, so a small time extension for a significant increase, well beyond the minimum of 70% largely due to street alignment.

Further to the above, a review of measured site data of Mildura (closest site in terms of latitude to the Waterloo Metro Quarter) of the direct normal solar irradiance was undertaken to understand the potential difference in quality of sunlight between 3pm and 3:30pm. The levels at 4pm would be between 67-76% of the 3pm levels. Noting that the extension period to achieve well beyond the minimum compliance is only 30 minutes to 3:30pm. A conservative approach using linear interpolation means this would be approximately 83.5-88% of the direct solar irradiance levels at 3pm.

Central Precinct Review

The review of the solar access outcomes for Building 2 in the Central precinct were discussed by the peer reviewer, stating that an assessment period of 8am to 4pm was used. It notes that the summary table in the Appendix of the report omitted the 9am to 3pm results.

The results which the peer reviewer considers to be achieved are notably different to the submitted results which considers the 1m² solar access requirement.

RWDI Comment *The solar access performance for the Central Precinct (Building 2) has been assessed between the hours of 9am to 3pm, however the results between 8am and 4pm were also presented for completeness. It is noted in Section 8 of the report that that an extension of time of 30 minutes (until 3:30pm) will enable 80% of apartments to achieve access to sunlight for BOTH the living space windows and Private Outdoor Areas.*

The tabulated results for the 9am to 3pm are noted to be omitted and appended to this letter..

The peer reviewer has undertaken their assessment based on a minimum of 1m² of solar access to be achieved for both the Living Space window as well as the Private Outdoor Areas.

This interpretation is not in line with the Apartment Design Guide (ADG) requirements which only states 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 9 am and 3 pm at mid winter in the Sydney Metropolitan Area and...”. The ADG does not specify a minimum area for direct sunlight for this period of assessment. Some Council DCPs had noted this requirement during the RFDC assessment period however are superseded with the introduction of the ADG. The reference to 1m² in the ADG for solar access is noted in the Design Guidance of Objective 4A-1 which notes “To maximise the benefit to residents of direct sunlight within living rooms and private open spaces, a minimum of 1m² of direct sunlight, measured at 1m above floor level, is achieved for at least 15 minutes”. As can be noted, this design guidance states that the 1m² of direct sunlight is required for at least 15 minutes, not the entire 2 hr period, with this also noted to only be to maximise the benefit to residents. This guidance is used when considering the 15% requirement for apartments that don’t achieve any access to sunlight.

With this above clarification and the noted model alignment commentary, it is expected that the peer reviewers results would align more closely with the presented results in the solar access report.

Southern Precinct Review

Commentary provided by the peer reviewer is noted to be in line with the comments made for the Central Precinct.

RWDI Comment *Response to the comments made for the Southern Precinct by the peer reviewer are the same as that noted for the Central Precinct.*

With this above clarification and the noted model alignment commentary, it is expected that the peer reviewers results would align more closely with the presented results in the solar access report.

Other Comments

A review of the Alexandria Park overshadowing notes the level of accuracy of the assessment and therefore no reason to doubt the results.

Overshadowing to the neighbouring properties has been presented in the form shadows to the ground plane, while overshadowing to the living space areas of the adjacent properties was not presented.

It is noted that the submitted design appears to result in an improved outcome compared to the concept approval.

RWDI Comment *The comment regarding overshadowing to Alexandria Park is noted.*

The overshadowing to surrounding neighbours was initially noted with a comparison to the approved concept. However additional information with regards to the overshadowing to the adjacent neighbouring apartment buildings was presented as part of a separate addendum memo in response to comments raised by the City of Sydney.



Conclusion

The peer review undertaken by Walsh Analysis generally is in agreement with the modelling undertaken by RWDI for the Solar Access assessment for the project. Some items were raised with regards to the period of assessment considered for the solar access study and also the approach used. These items have been clarified in this memo, which should assist in the review carried out by Walsh Analysis and enable agreement with the outcomes noted in the report. Any further items can be further clarified by RWDI.

Table A1: Direct Solar Access Results for Living Space Windows (June 21, 9:00 am - 3:00 pm)

Apartment Number	Any Sunlight		1m ² Area	
	Number Of Hours	Time(s)	Number Of Hours	Time(s)
301	2.75	09:00-11:45	2.75	09:00-11:45
302	2.00	09:00-11:00	1.50	09:00-10:30
303	0.00	No Solar Access	0.00	No Solar Access
305	1.50	13:30-15:00	1.00	14:00-15:00
306	1.50	13:30-15:00	1.50	13:30-15:00
307	1.00	14:00-15:00	1.00	14:00-15:00
308	0.75	09:00-09:45	0.75	09:00-09:45
309	1.50	09:00-10:30	1.50	09:00-10:30
401	2.75	09:00-11:45	2.75	09:00-11:45
402	2.00	09:00-11:00	1.50	09:00-10:30
403	0.00	No Solar Access	0.00	No Solar Access
405	1.50	13:30-15:00	1.00	14:00-15:00
406	1.50	13:30-15:00	1.50	13:30-15:00
407	1.00	14:00-15:00	1.00	14:00-15:00
408	0.75	09:00-09:45	0.75	09:00-09:45
409	2.50	09:00-11:30	2.50	09:00-11:30
501	3.25	09:00-12:15	2.75	09:00-11:45
502	2.00	09:00-11:00	1.50	09:00-10:30
503	0.00	No Solar Access	0.00	No Solar Access
505	1.50	13:30-15:00	1.00	14:00-15:00
506	1.75	13:15-15:00	1.50	13:30-15:00
507	1.00	14:00-15:00	1.00	14:00-15:00
508	0.75	09:00-09:45	0.75	09:00-09:45
509	2.50	09:00-11:30	2.50	09:00-11:30
601	3.25	09:00-12:15	3.00	09:00-12:00
602	2.00	09:00-11:00	1.50	09:00-10:30
603	0.00	No Solar Access	0.00	No Solar Access
605	1.50	13:30-15:00	1.00	14:00-15:00
606	1.75	13:15-15:00	1.75	13:15-15:00
607	1.75	09:00-09:45 and 14:00-15:00	1.50	09:00-09:30 and 14:00-15:00
608	2.00	09:00-11:00	2.00	09:00-11:00
609	2.50	09:00-11:30	2.50	09:00-11:30
701	3.25	09:00-12:15	2.75	09:00-11:45
702	2.00	09:00-11:00	1.50	09:00-10:30
703	0.00	No Solar Access	0.00	No Solar Access
705	1.50	13:30-15:00	1.00	14:00-15:00
706	1.75	13:15-15:00	1.75	13:15-15:00
707	2.25	09:00-09:45 and 13:30-15:00	2.00	09:00-09:30 and 13:30-15:00
708	2.00	09:00-11:00	2.00	09:00-11:00
709	3.00	09:00-12:00	2.50	09:00-11:30
801	3.25	09:00-12:15	2.75	09:00-11:45
802	2.00	09:00-11:00	1.50	09:00-10:30
803	0.00	No Solar Access	0.00	No Solar Access
805	1.50	13:30-15:00	1.00	14:00-15:00
806	2.75	12:15-15:00	2.25	12:45-15:00
807	2.25	09:00-09:45 and 13:30-15:00	2.25	09:00-09:45 and 13:30-15:00
808	2.00	09:00-11:00	2.00	09:00-11:00
809	3.75	09:00-12:45	3.50	09:00-12:30
901	3.25	09:00-12:15	3.00	09:00-12:00
902	2.00	09:00-11:00	1.50	09:00-10:30
903	0.00	No Solar Access	0.00	No Solar Access
905	1.50	13:30-15:00	1.00	14:00-15:00
906	3.00	12:00-15:00	2.25	12:45-15:00
907	4.75	09:00-12:15 and 13:30-15:00	4.75	09:00-12:15 and 13:30-15:00
908	3.25	09:00-12:15	3.25	09:00-12:15
909	4.25	09:00-13:15	4.00	09:00-13:00
1001	3.25	09:00-12:15	2.75	09:00-11:45
1002	2.00	09:00-11:00	1.50	09:00-10:30
1003	0.00	No Solar Access	0.00	No Solar Access
1005	1.50	13:30-15:00	1.00	14:00-15:00
1006	3.00	12:00-15:00	2.25	12:45-15:00
1007	6.00	09:00-15:00	6.00	09:00-15:00
1008	4.50	09:00-13:30	4.50	09:00-13:30
1009	5.00	09:00-14:00	4.25	09:00-13:15
1101	3.25	09:00-12:15	2.75	09:00-11:45
1102	2.00	09:00-11:00	1.50	09:00-10:30
1103	0.00	No Solar Access	0.00	No Solar Access
1105	1.50	13:30-15:00	1.00	14:00-15:00
1106	3.00	12:00-15:00	2.25	12:45-15:00
1107	6.00	09:00-15:00	6.00	09:00-15:00
1108	5.00	09:00-14:00	5.00	09:00-14:00

Table A1: Direct Solar Access Results for Living Space Windows (June 21, 9:00 am - 3:00 pm)

Apartment Number	Any Sunlight		1m ² Area	
	Number Of Hours	Time(s)	Number Of Hours	Time(s)
1109	5.25	09:00-14:15	4.25	09:00-13:15
1201	3.25	09:00-12:15	2.75	09:00-11:45
1202	2.00	09:00-11:00	1.50	09:00-10:30
1203	0.00	No Solar Access	0.00	No Solar Access
1205	1.50	13:30-15:00	1.00	14:00-15:00
1206	3.00	12:00-15:00	2.25	12:45-15:00
1207	6.00	09:00-15:00	6.00	09:00-15:00
1208	6.00	09:00-15:00	6.00	09:00-15:00
1209	5.25	09:00-14:15	4.25	09:00-13:15
1301	3.25	09:00-12:15	2.75	09:00-11:45
1302	2.00	09:00-11:00	1.50	09:00-10:30
1303	0.00	No Solar Access	0.00	No Solar Access
1305	1.50	13:30-15:00	1.00	14:00-15:00
1306	3.00	12:00-15:00	2.25	12:45-15:00
1307	6.00	09:00-15:00	6.00	09:00-15:00
1308	6.00	09:00-15:00	6.00	09:00-15:00
1309	5.25	09:00-14:15	4.25	09:00-13:15
1401	3.25	09:00-12:15	2.75	09:00-11:45
1402	2.00	09:00-11:00	1.50	09:00-10:30
1403	0.00	No Solar Access	0.00	No Solar Access
1405	1.50	13:30-15:00	1.00	14:00-15:00
1406	3.00	12:00-15:00	2.25	12:45-15:00
1407	6.00	09:00-15:00	6.00	09:00-15:00
1408	6.00	09:00-15:00	6.00	09:00-15:00
1409	5.25	09:00-14:15	4.25	09:00-13:15
1501	3.25	09:00-12:15	2.75	09:00-11:45
1502	2.00	09:00-11:00	1.50	09:00-10:30
1503	0.00	No Solar Access	0.00	No Solar Access
1505	1.50	13:30-15:00	1.00	14:00-15:00
1506	3.00	12:00-15:00	2.25	12:45-15:00
1507	6.00	09:00-15:00	6.00	09:00-15:00
1508	6.00	09:00-15:00	6.00	09:00-15:00
1509	5.25	09:00-14:15	4.25	09:00-13:15
1601	3.25	09:00-12:15	2.75	09:00-11:45
1602	2.00	09:00-11:00	1.50	09:00-10:30
1603	0.00	No Solar Access	0.00	No Solar Access
1605	1.50	13:30-15:00	1.00	14:00-15:00
1606	3.00	12:00-15:00	2.25	12:45-15:00
1607	6.00	09:00-15:00	6.00	09:00-15:00
1608	6.00	09:00-15:00	6.00	09:00-15:00
1609	5.25	09:00-14:15	4.25	09:00-13:15
1701	3.25	09:00-12:15	2.75	09:00-11:45
1702	2.00	09:00-11:00	1.50	09:00-10:30
1703	0.00	No Solar Access	0.00	No Solar Access
1705	1.50	13:30-15:00	1.00	14:00-15:00
1706	3.00	12:00-15:00	2.25	12:45-15:00
1707	6.00	09:00-15:00	6.00	09:00-15:00
1708	6.00	09:00-15:00	6.00	09:00-15:00
1709	5.25	09:00-14:15	4.25	09:00-13:15
1801	3.25	09:00-12:15	2.75	09:00-11:45
1802	2.00	09:00-11:00	1.50	09:00-10:30
1803	0.00	No Solar Access	0.00	No Solar Access
1805	1.50	13:30-15:00	1.00	14:00-15:00
1806	3.00	12:00-15:00	2.25	12:45-15:00
1807	6.00	09:00-15:00	6.00	09:00-15:00
1808	6.00	09:00-15:00	6.00	09:00-15:00
1809	5.25	09:00-14:15	4.25	09:00-13:15
1901	3.25	09:00-12:15	2.75	09:00-11:45
1902	2.00	09:00-11:00	1.50	09:00-10:30
1903	0.00	No Solar Access	0.00	No Solar Access
1905	1.50	13:30-15:00	1.00	14:00-15:00
1906	3.00	12:00-15:00	2.25	12:45-15:00
1907	6.00	09:00-15:00	6.00	09:00-15:00
1908	6.00	09:00-15:00	6.00	09:00-15:00
1909	5.25	09:00-14:15	4.25	09:00-13:15
2001	2.00	09:00-11:00	1.50	09:00-10:30
2002	0.00	No Solar Access	0.00	No Solar Access
2003	0.50	14:30-15:00	0.25	14:45-15:00
2005	6.00	09:00-15:00	6.00	09:00-15:00
2006	6.00	09:00-15:00	6.00	09:00-15:00
2007	1.75	09:00-10:45	1.25	09:00-10:15

Table A1: Direct Solar Access Results for Living Space Windows (June 21, 9:00 am - 3:00 pm)

Apartment Number	Any Sunlight		1m ² Area	
	Number Of Hours	Time(s)	Number Of Hours	Time(s)
2101	2.00	09:00-11:00	1.50	09:00-10:30
2102	0.00	No Solar Access	0.00	No Solar Access
2103	0.50	14:30-15:00	0.25	14:45-15:00
2105	6.00	09:00-15:00	6.00	09:00-15:00
2106	6.00	09:00-15:00	6.00	09:00-15:00
2107	1.75	09:00-10:45	1.50	09:00-10:30
2201	3.25	09:00-12:15	2.75	09:00-11:45
2202	6.00	09:00-15:00	6.00	09:00-15:00

Table A2: Direct Solar Access Results for Private Open Spaces (June 21, 9:00 am - 3:00 pm)

Apartment Number	Any Sunlight		1m² Area		50% Floor Area	
	Number Of Hours	Time(s)	Number Of Hours	Time(s)	Number Of Hours	Time(s)
1505	1.50	13:30-15:00	0.00	No Solar Access	0.00	No Solar Access
1506	1.50	13:30-15:00	0.00	No Solar Access	0.00	No Solar Access
1507	6.00	09:00-15:00	5.00	10:00-15:00	1.50	13:30-15:00
1508	6.00	09:00-15:00	6.00	09:00-15:00	3.00	09:00-12:00
1509	3.25	09:00-12:15	2.50	09:00-11:30	0.50	09:00-09:30
1601	3.25	09:00-12:15	2.25	09:00-11:15	0.00	No Solar Access
1602	2.75	09:00-11:45	2.50	09:00-11:30	1.50	09:00-10:30
1603	1.00	14:00-15:00	0.50	14:30-15:00	0.00	No Solar Access
1605	1.50	13:30-15:00	0.00	No Solar Access	0.00	No Solar Access
1606	1.50	13:30-15:00	0.00	No Solar Access	0.00	No Solar Access
1607	6.00	09:00-15:00	5.00	10:00-15:00	1.50	13:30-15:00
1608	6.00	09:00-15:00	6.00	09:00-15:00	3.00	09:00-12:00
1609	3.25	09:00-12:15	2.50	09:00-11:30	0.50	09:00-09:30
1701	3.25	09:00-12:15	2.25	09:00-11:15	0.00	No Solar Access
1702	2.75	09:00-11:45	2.50	09:00-11:30	1.50	09:00-10:30
1703	1.00	14:00-15:00	0.50	14:30-15:00	0.00	No Solar Access
1705	1.50	13:30-15:00	0.00	No Solar Access	0.00	No Solar Access
1706	1.50	13:30-15:00	0.00	No Solar Access	0.00	No Solar Access
1707	6.00	09:00-15:00	5.00	10:00-15:00	1.50	13:30-15:00
1708	6.00	09:00-15:00	6.00	09:00-15:00	3.00	09:00-12:00
1709	3.25	09:00-12:15	2.50	09:00-11:30	0.50	09:00-09:30
1801	3.25	09:00-12:15	2.25	09:00-11:15	0.00	No Solar Access
1802	2.75	09:00-11:45	2.50	09:00-11:30	1.50	09:00-10:30
1803	1.00	14:00-15:00	0.50	14:30-15:00	0.00	No Solar Access
1805	1.50	13:30-15:00	0.00	No Solar Access	0.00	No Solar Access
1806	1.50	13:30-15:00	0.00	No Solar Access	0.00	No Solar Access
1807	6.00	09:00-15:00	5.00	10:00-15:00	1.50	13:30-15:00
1808	6.00	09:00-15:00	6.00	09:00-15:00	3.00	09:00-12:00
1809	3.25	09:00-12:15	2.50	09:00-11:30	0.50	09:00-09:30
1901	3.25	09:00-12:15	2.25	09:00-11:15	0.00	No Solar Access
1902	2.75	09:00-11:45	2.50	09:00-11:30	1.50	09:00-10:30
1903	1.00	14:00-15:00	0.50	14:30-15:00	0.00	No Solar Access
1905	1.50	13:30-15:00	0.00	No Solar Access	0.00	No Solar Access
1906	1.50	13:30-15:00	0.00	No Solar Access	0.00	No Solar Access
1907	6.00	09:00-15:00	5.00	10:00-15:00	1.50	13:30-15:00
1908	6.00	09:00-15:00	6.00	09:00-15:00	3.00	09:00-12:00
1909	3.25	09:00-12:15	2.50	09:00-11:30	0.50	09:00-09:30
2001	2.75	09:00-11:45	2.50	09:00-11:30	1.50	09:00-10:30
2002	1.00	14:00-15:00	0.50	14:30-15:00	0.00	No Solar Access
2003	1.50	13:30-15:00	1.00	14:00-15:00	0.00	No Solar Access
2005	6.00	09:00-15:00	5.00	10:00-15:00	2.00	13:00-15:00
2006	6.00	09:00-15:00	6.00	09:00-15:00	3.25	09:00-12:15
2007	3.25	09:00-12:15	2.75	09:00-11:45	1.50	09:00-10:30
2101	2.75	09:00-11:45	2.50	09:00-11:30	1.50	09:00-10:30
2102	1.50	13:30-15:00	1.25	13:45-15:00	0.00	No Solar Access
2103	1.50	13:30-15:00	1.00	14:00-15:00	0.00	No Solar Access
2105	6.00	09:00-15:00	5.00	10:00-15:00	2.25	12:45-15:00
2106	6.00	09:00-15:00	6.00	09:00-15:00	4.00	09:00-13:00
2107	3.25	09:00-12:15	2.75	09:00-11:45	1.50	09:00-10:30
2201	5.25	09:00-14:15	4.50	09:00-13:30	0.00	No Solar Access
2202	6.00	09:00-15:00	6.00	09:00-15:00	6.00	09:00-15:00