

**WATERLOO METRO QUARTER
CENTRAL PRECINCT**

**SSD-10439 - RESPONSE TO SUBMISSIONS
DESIGN STATEMENT**

DPIE RFI - 13/04/2021

Contents

Acknowledgment of Country

We acknowledge and respect Traditional Owners across Australia as the original custodians of our land and waters, their unique ability to care for country and deep spiritual connection to it. We honour Elders past, present and emerging whose knowledge and wisdom has, and will, ensure the continuation of cultures and traditional practices.



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Document Control

Rev	Date	Approved By	Description
01	27.07.2021	Liz Westgarth	Response to Submission

EXECUTIVE SUMMARY

In response to Department of Planning, Industry and Environment's request to explore additional options and opportunities to further maximise solar access to the residential apartments proposed within the Central Precinct SSDA (SSD-10439), this report outlines the design changes introduced to improve solar access to a number of apartments on the south east and west elevation in accordance with the intent of Apartment Design Guide (ADG).

The intent of the ADG seeks to optimise the number of apartments receiving sunlight into habitable rooms, primary windows and private open space (POS), while maximising the quality of direct solar access to these spaces.

In addition to the ADG, a number of key considerations have been identified to achieve a balanced outcome for apartment amenity, public domain amenity and overall urban experience and outcome in the overall WMQ precinct:

- Provide a balanced approach to apartment amenity by optimising access to view, privacy, apartment layout and functionality etc.
- Create a considered urban outcome by optimising activation, architectural expression and minimising overshadowing to Alexandria Park

Considering the above, the following design changes are introduced to optimise solar access to the apartments:

- Adjustment to the south east apartment living room glazing, balustrade and structural column to improve solar access to the living room by an additional 10mins compared to the submitted DA.
- Level 20 and 21 east facing 2 bedroom apartments living room glazing to shift east to allow living room to receive 2 hours of solar access between 9:00am and 3:00pm mid winter. This design change allows 2 additional east facing apartments receiving 2 hours of solar access to both living room and POS between 9:00am and 3:00pm mid winter compared to the submitted DA.
- Adjustment to the west facing 1 bedroom apartment facade to create north facing frontage to the adjacent POS, allowing solar access to the POS at 1pm mid winter. This design change allows 14 additional west facing 1 bedroom apartments to receive 1 hour and 50 mins of solar access to both living room and POS between 9:00am and 3:00pm mid winter compared to the submitted DA.

The design changes proposed provide improvements to the solar access of the apartments in accordance with the ADG intent to maximise solar access, while ensuring a balanced amenity outcome for the apartments, public domain and urban experience. In our opinion this meets the intent of the ADG.

The improvement to the solar access is outlined below:

2 additional east high rise apartments on level 20 and 21 that receive 2 hours of solar access to both living room and POS between 9:00am and 3:00pm mid winter.

+14 additional west apartments between level 6 and level 19 that receive 1 hour and 50 mins of solar access of 1 sqm area to both living room and POS between 1:10pm and 3:00pm mid winter. The living room glazing and POS receives solar access between 1:00pm and 1:10pm, however, not for a minimum of 1 sqm area. The 12 apartments achieve the objectives of the ADG.

+19 additional south east apartments between level 3 and level 21 that receive 1 hour and 40 minutes of solar access of 1 sqm area to living room glazing and 2 hours to the POS between 9:00am and 3:00pm mid winter. The living room glazing receives solar access between 10:40am and 11:00am, however, not for a minimum of 1 sqm area. The 19 apartments achieve the objectives of the ADG.

COMPARISON SUMMARY TABLE

	DA Scheme		Design Change			
	Peer view assessment of submitted DA (Base)		Peer view assessment of submitted DA (Base) plus design change to L20/21 east high rise apartments		Peer view assessment of submitted DA (Base) plus design changes to the east highrise apartments, south east apartments that achieves minimum 2 hours to the POS and the facade of the living room but less than 1sqm area for 20 minutes and west apartments that achieves minimum 2 hours to the POS and the facade of the living room but less than 1sqm area for 10 minutes	
	No. of compliant apartments	% of compliant apartments	No. of compliant apartments	% of compliant apartments	No. of consistent apartments	% of consistent apartments
POS	86	57%	86	57%	105	70%
Living	78	52%	80	53%	101	67%
Living or POS	88	59%	88	59%	105	70%
Both Living & POS	66	44%	68	45%	101	67%

DESIGN CHANGES OVERVIEW

Proposed Design Changes

South East Apartments

- Shift living room glazing and balustrade east while not creating additional overshadowing to Alexandria Park.
- Reshaping and relocating the south east corner column to be within the apartment.
- To create a consistent architectural language to the building, the proposed design changes to the south east apartment are adopted for all corner apartments.

West 1 Bedroom Apartments

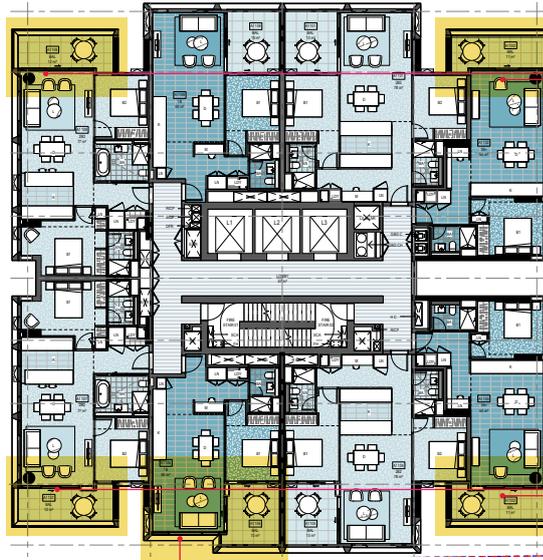
- Shifting the west 1 bedroom living room facade east to allow north facing frontage to the adjacent POS to receive solar access at 1:00pm mid winter.
- Similarly, the west facade change is reflected in the vertical stack from level 3 to rooftop terrace to provide consistency in built form.

East 2 Bedroom Apartments

- Shifting the east captured 2 bedroom apartment living room glazing further east to achieve 2 hours of solar access to living room between 9:00am and 3:00pm mid winter.
- Similarly, this change is reflected in the mirrored west apartments to provide consistency in built form.

Internal Apartment Layout

- Minor adjustment to the internal layout of the apartments responding to changes made to the facade.
- Adjacent diagrams outline the design changes to the DA submission.

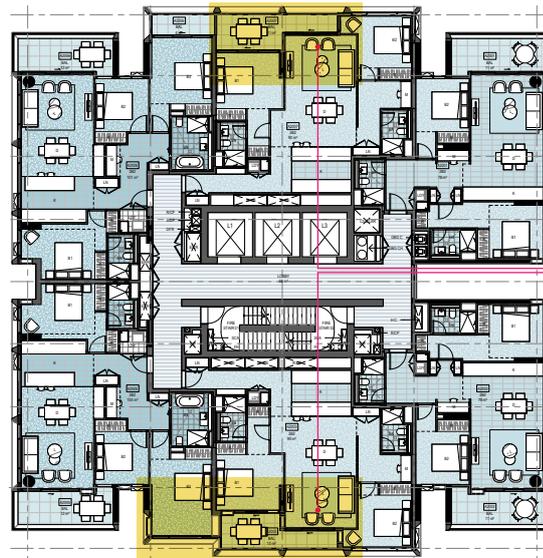


Plan of typical floor plate

Living room glazing and balustrade shift east. Corner column reshape and relocation.

Living room glazing and balustrade shift west. Corner column reshape and relocation.

Living room facade shift east to allow north frontage for adjacent POS



Plan of Level 20 & 21

Living room facade shift east and west.
+ All changes on typical floor plate.

DESIGN CHANGES OVERVIEW

Resulted Solar Amenity from Proposed Design Changes

The design changes to level 20/21 east facing 2 bedroom apartments allow an additional 2 apartments to achieve 2 hours direct solar access between 9:00am and 3:00pm mid winter, bringing the total compliance to 68 apartments and 45%.

The design changes to the west facing 1 bedroom apartment allows the living room and POS between level 6 and level 19 to achieve 1 hour and 50 mins of 1sqm solar access. The living room and POS of the apartments achieve a minimum of 2 hours solar access but less than 1sqm for 10 mins.

The POS of the south east apartments between level 3 and level 21 achieve

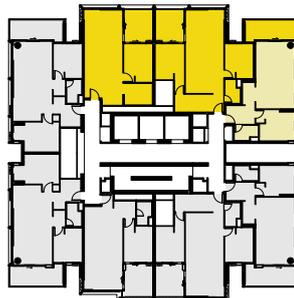
ADG solar compliance while the living rooms achieve just shy of 2 hours at 1 hour and 40 minutes when measured to a minimum of 1sqm area. However, the living room of the south east apartment has access to great morning sun from 7:10am, which is illustrated in the following analysis.

	DA Scheme		Design Change			
	Peer view assessment of submitted DA (Base)		Peer view assessment of submitted DA (Base) plus design change to L20/21 east high rise apartments		Peer view assessment of submitted DA (Base) plus design changes to the east highrise apartments, south east apartments that achieves minimum 2 hours to the POS and the facade of the living room but less than 1sqm area for 20 minutes and west apartments that achieves minimum 2 hours to the POS and the facade of the living room but less than 1sqm area for 10 minutes	
	No. of compliant apartments	% of compliant apartments	No. of compliant apartments	% of compliant apartments	No. of consistent apartments	% of consistent apartments
POS	86	57%	86	57%	105	70%
Living	78	52%	80	53%	102	68%
Living or POS	88	59%	88	59%	105	70%
Both Living & POS	66	44%	68	45%	101	67%

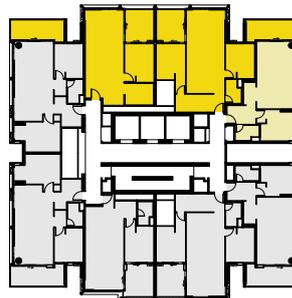
- Living room or POS that receive 2 hours of direct sunlight between 9am to 3pm mid winter
- Living room or POS that receives 1 hour and 50 minutes of direct sunlight between 9am to 3pm mid winter
- Living room that receives 1 hour and 40 minutes of direct sunlight between 9am to 3pm mid winter
- Living room or POS that receives less than 2 hours of direct sunlight between 9am to 3pm mid winter



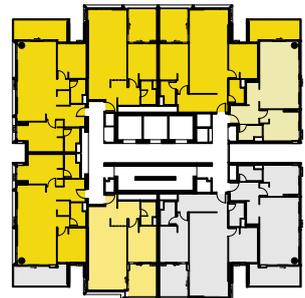
Level 3 solar amenity diagram



Level 4 solar amenity diagram



Level 5 solar amenity diagram



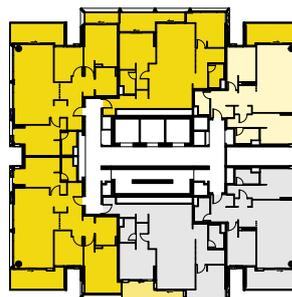
Level 6 solar amenity diagram



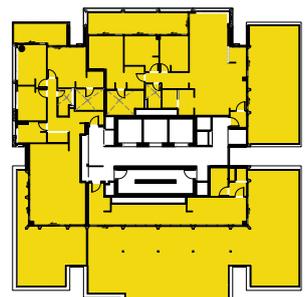
Level 7 solar amenity diagram



Level 8-19 solar amenity diagram



Level 20-21 solar amenity diagram



Level 22 solar amenity diagram

DESIGN CHANGES

SOUTH EAST APARTMENT

The south east apartment currently receives great morning sun from 7:10am mid winter.

The opportunity was explored to improve solar access of the living room while considering overshadowing to Alexandria Park, POS depth and architectural expression.

DA Scheme

Diagrams below shows the solar amenity to the living room window of the DA scheme. The living room window receives more than 1sqm of direct sunlight for 1 hour and 30 mins between 9:00am and 10:30am mid winter.



	DA
8:00 am	1 sqm+
8:15 am	1 sqm+
8:30 am	1 sqm+
8:45 am	1 sqm+
9:00 am	1 sqm+
9:15 am	1 sqm+
9:30 am	1 sqm+
9:45 am	1 sqm+
10:00 am	1 sqm+
10:15 am	1 sqm+
10:30 am	1 sqm
10:45 am	0.46 sqm
11:00 am	sun hits glass

Walsh Analysis method adopted for above measurement

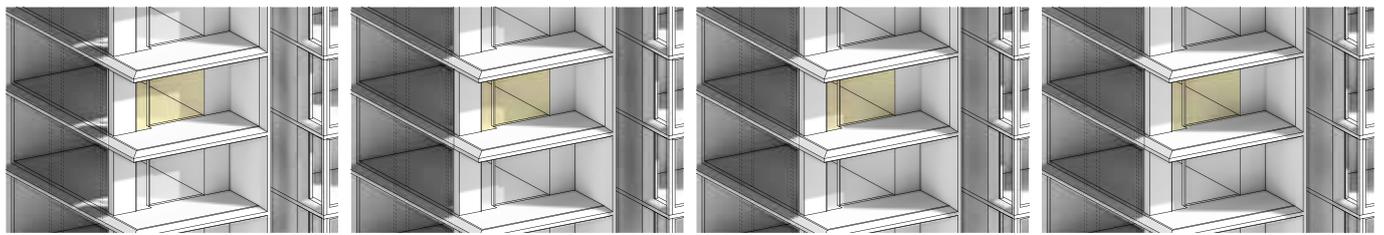


08:00am

08:30am

09:00am

09:30am



10:00am

10:30am

10:45am

11:00am

 Living Room Glazing

DESIGN CHANGES

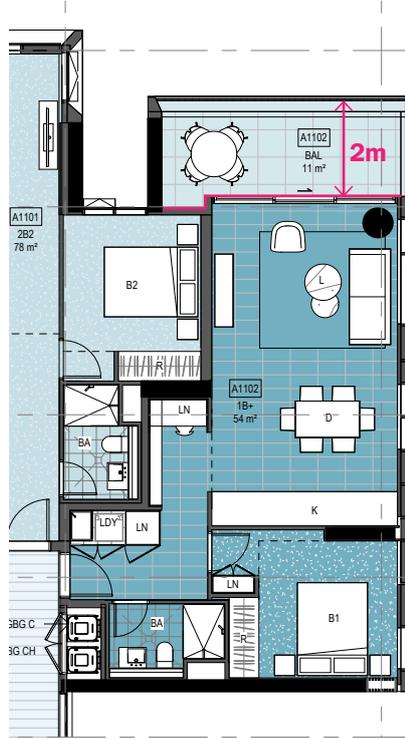
SOUTH EAST APARTMENT

Proposed Design Changes to South East Apartment

Glazing and balustrade to move east by 240mm to improve solar amenity of the living room while maintaining the depth required for POS.

Reshape and relocate south east column to be within the apartment to maximise glazing to the living room.

With the above design change, the solar amenity to the living room between level 3 and level 21 are improved by 10mins compared to the DA scheme. The living room window receives more than 1sqm of direct sunlight for 1 hour and 40 mins between 9:00am and 10:40am mid winter.



	Proposed
8:00 am	1 sqm+
8:15 am	1 sqm+
8:30 am	1 sqm+
8:45 am	1 sqm+
9:00 am	1 sqm+
9:15 am	1 sqm+
9:30 am	1 sqm+
9:45 am	1 sqm+
10:00 am	1 sqm+
10:15 am	1 sqm+
10:30 am	1 sqm+
10:40 am	1.0 sqm
10:45 am	0.77 sqm
10:50 am	0.58 sqm
10:55 am	0.39 sqm
11:00 am	0.17 sqm

Walsh Analysis method adopted for above measurement

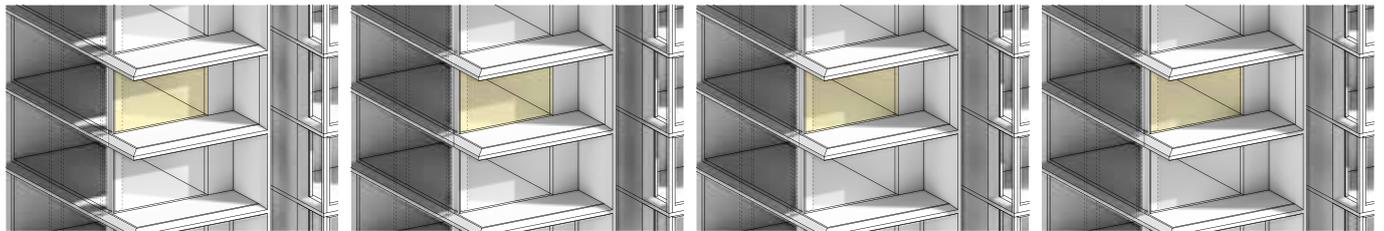


08:00am

08:30am

09:00am

09:30am



10:00am

10:30am

10:45am

11:00am

Living Room Glazing

DESIGN CHANGES

WEST APARTMENTS

The living room of west facing 1 bedroom apartment complies with ADG solar access requirement while the POS of the apartment achieves 10mins of 1 sqm direct solar between 2:50pm and 3:00pm mid winter.

The opportunity was explored to improve solar access of the POS by shaping the western facade to achieve full compliance.

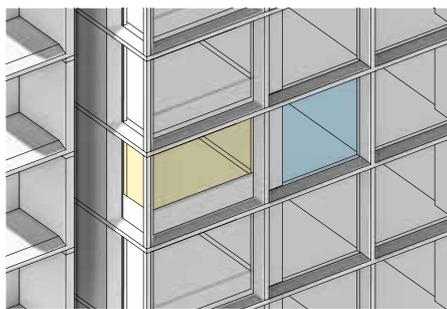
DA Scheme

Diagrams below shows the solar amenity to the living room window of the DA scheme. The living room window receives more than 1 sqm of direct sunlight for 2 hours between 1:00pm and 3:00pm mid winter.

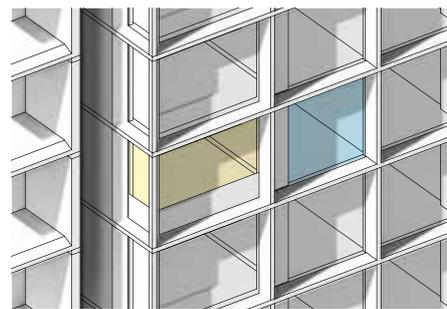


	DA	
	Living room	POS
1:00 pm	1 sqm+	No solar access
1:05 pm	1 sqm+	No solar access
1:10 pm	1 sqm+	No solar access
1:15 pm	1 sqm+	No solar access
1:30 pm	1 sqm+	No solar access
1:45 pm	1 sqm+	0.03 sqm
2:00 pm	1 sqm+	0.19 sqm
2:30 pm	1 sqm+	0.68 sqm
2:50 pm	1 sqm+	1 sqm+
3:00 pm	1 sqm+	1 sqm+

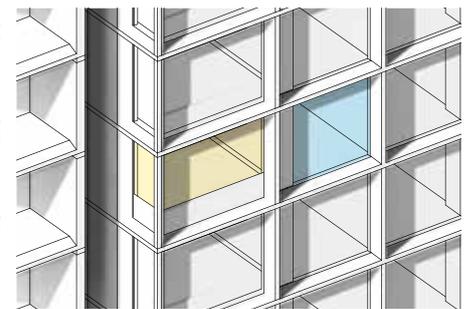
Walsh Analysis method adopted for above measurement



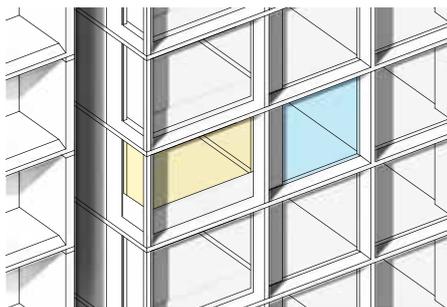
01:00pm



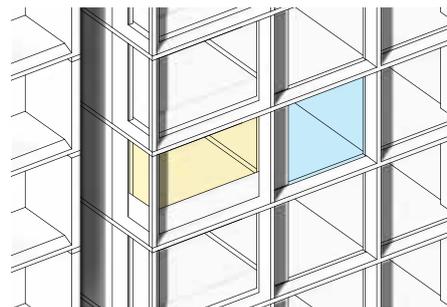
01:30pm



02:00pm



02:30pm



03:00pm

Living Room Glazing
POS

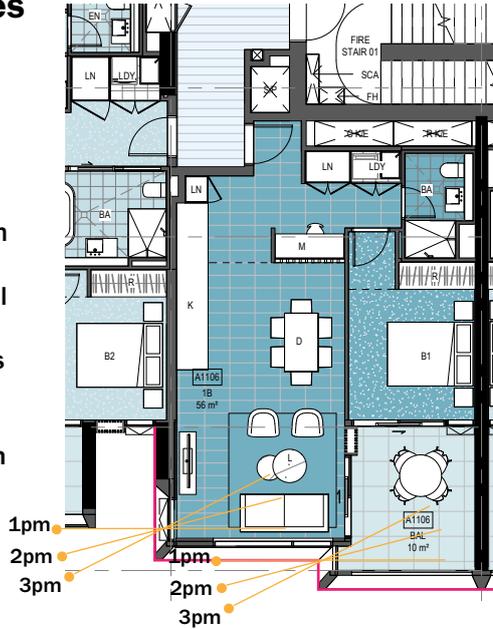
DESIGN CHANGES

WEST APARTMENTS

Proposed Design Changes to West Apartment

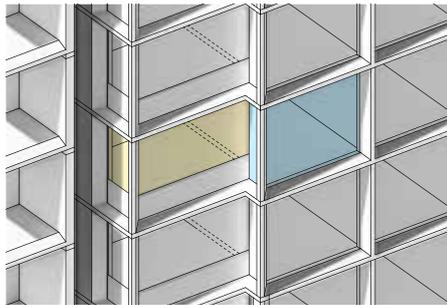
The west facade of the 1 bedroom apartment living room to shift east 700mm to provide north facing frontage to the adjacent POS.

With the above design change, both the living room and POS of the 1 bedroom apartments between level 6 and level 19 achieve 1 sqm of solar access for 1 hour and 50mins between 1:10pm and 3:00pm mid winter. The living room and POS receive solar access for a minimum of 2 hours between 9:00am and 3:00pm but less than 1sqm for 10 mins.

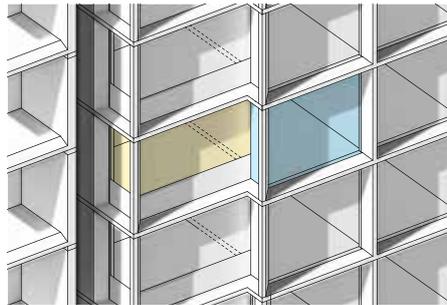


	Proposed	
	Living room	POS
1:00 pm	0.77sqm	0.82sqm
1:05 pm	0.89sqm	0.88sqm
1:10 pm	1 sqm+	1 sqm+
1:15 pm	1 sqm+	1 sqm+
1:30 pm	1 sqm+	1 sqm+
1:45 pm	1 sqm+	1 sqm+
2:00 pm	1 sqm+	1 sqm+
2:30 pm	1 sqm+	1 sqm+
2:50 pm	1 sqm+	1 sqm+
3:00 pm	1 sqm+	1 sqm+

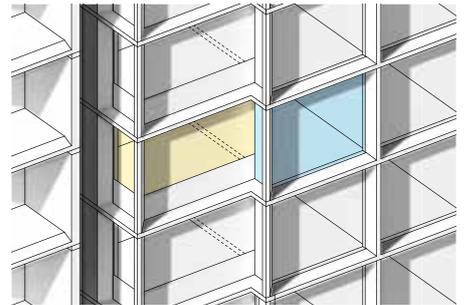
Walsh Analysis method adopted for above measurement



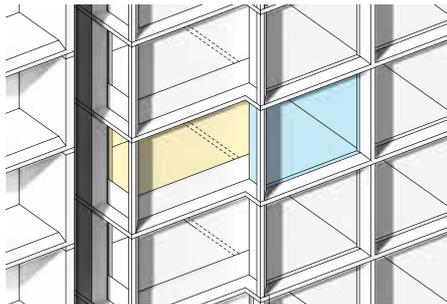
01:00pm



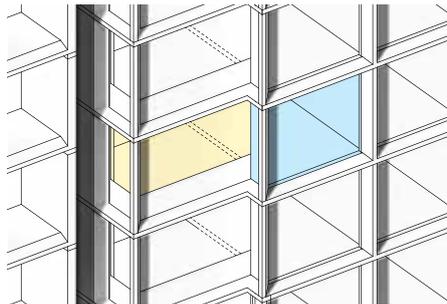
01:30pm



02:00pm



02:30pm



03:00pm

Living Room Glazing
POS

DESIGN CHANGES

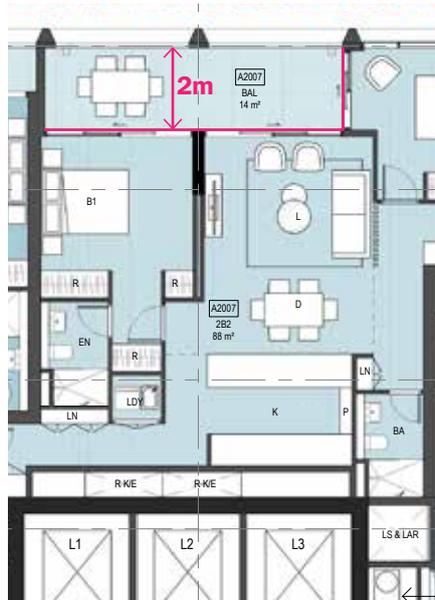
EAST HIGH RISE APARTMENTS

The POS of east facing captured 2 bedroom apartment on level 20 and 21 complies with ADG solar access requirement while the living room of the apartment achieves 1 hour and 20 mins of direct solar between 9:00am and 10:20am mid winter.

There is opportunity to shape the living room glazing to achieve full compliance.

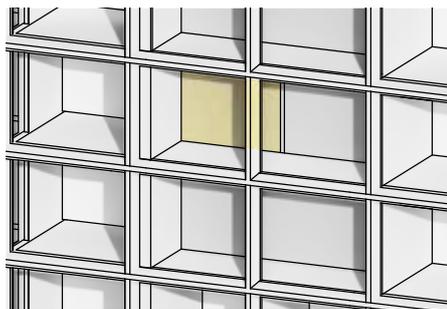
DA Scheme

Diagrams below shows the solar amenity to the living room window of the DA scheme. The living room window receives more than 1sqm of direct sunlight for 1 hour and 20 mins between 9:00am and 10:20am mid winter.

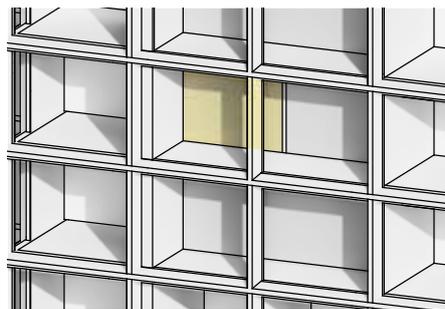


	DA	
	Living room	POS
9:00 am	1 sqm+	1 sqm+
9:30 am	1 sqm+	1 sqm+
10:00 am	1 sqm+	1 sqm+
10:20 am	1 sqm+	1 sqm+
10:30 am	0.78 sqm	1 sqm+
11:00 am	No solar access	1 sqm+

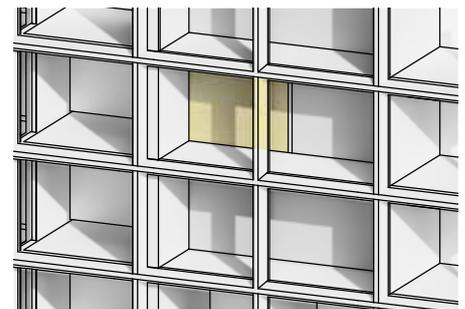
Walsh Analysis method adopted for above measurement



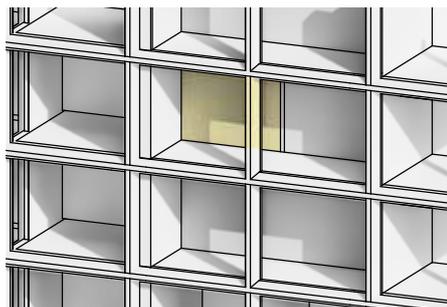
09:00am



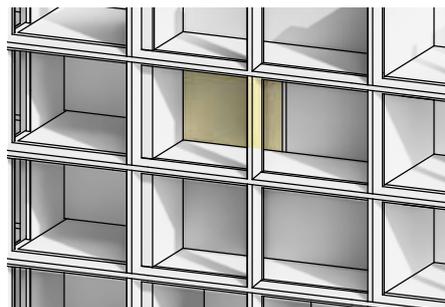
09:30am



10:00am



10:30am



11:00am

Living Room Glazing

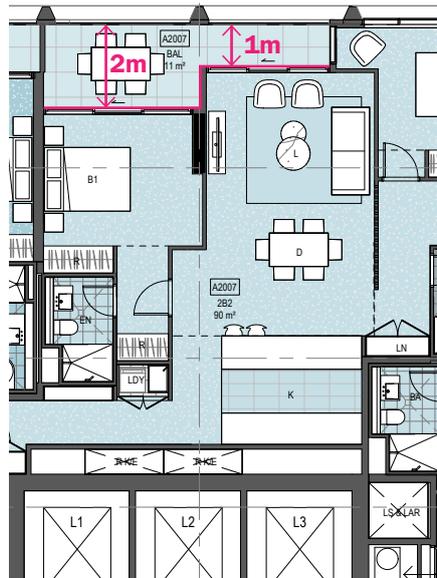
DESIGN CHANGES

EAST HIGH RISE APARTMENTS

Proposed Design Changes to East High Rise Apartment

The living room glazing is shifted east by 1m while maintaining the minimum requirement for depth and size of the POS in accordance to ADG.

With the above design change, both the living room and POS of the captured 2 bedroom apartments on level 20 and 21 receive 1sqm of solar access for 2 hours between 9:00am and 11:00am mid winter.

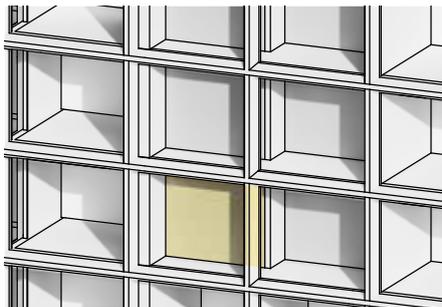


	Proposed	
	Living room	POS
9:00 am	1 sqm+	1 sqm+
9:30 am	1 sqm+	1 sqm+
10:00 am	1 sqm+	1 sqm+
10:30 am	1 sqm+	1 sqm+
11:00 am	1 sqm+	1 sqm+

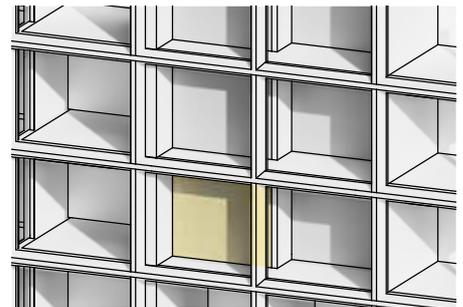
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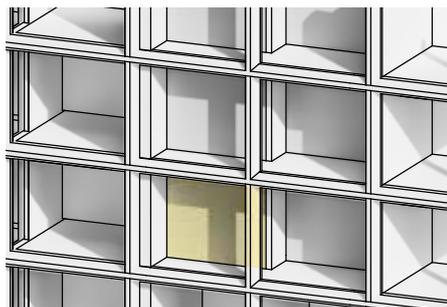
09:00am



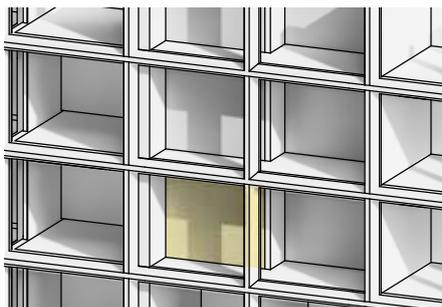
09:30am



10:00am



10:30am



11:00am

Living Room Glazing

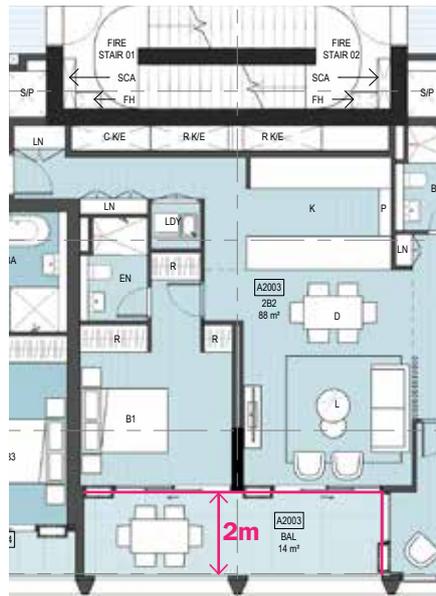
DESIGN CHANGES

WEST HIGH RISE APARTMENTS

Opportunity to improve solar access to living room and POS by adopting the same change as the east high rise apartments.

DA Scheme

The adjacent table shows the solar amenity to the living room window and POS of the DA scheme. The POS of west facing captured 2 bedroom apartment on level 20 and 21 achieves 1 hour and 5 mins of 1sqm direct solar between 1:55pm and 3:00pm mid winter while the living

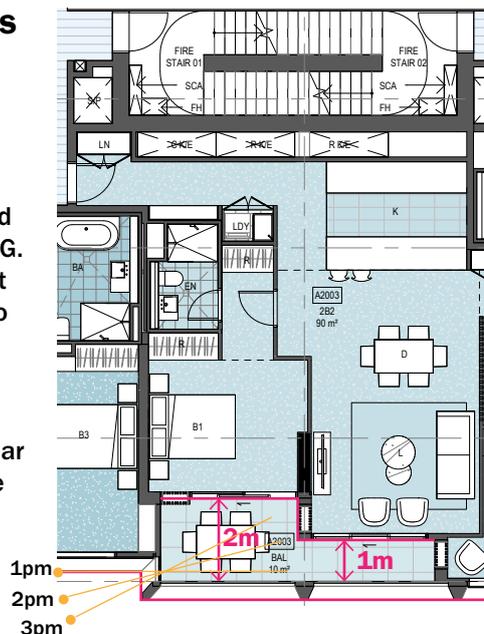


	DA	
	Living room	POS
1:00 pm	No solar access	No solar access
1:05 pm	No solar access	No solar access
1:10 pm	No solar access	No solar access
1:30 pm	No solar access	0.09sqm
1:35 pm	No solar access	0.26sqm
1:40 pm	No solar access	0.42sqm
1:45 pm	No solar access	0.69sqm
1:50 pm	No solar access	0.99sqm
1:55 pm	No solar access	1 sqm+
2:00 pm	No solar access	1 sqm+
2:05 pm	No solar access	1 sqm+
2:10 pm	No solar access	1 sqm+
2:30 pm	0.08sqm	1 sqm+
2:35 pm	0.34sqm	1 sqm+
2:40 pm	0.71sqm	1 sqm+
2:45 pm	1 sqm+	1 sqm+
3:00 pm	1 sqm+	1 sqm+

Proposed Design Changes to West High Rise Apartment

The living room glazing is shifted east by 1m while maintaining the minimum requirement for depth and size of the POS in accordance to ADG. The bedroom of adjacent apartment to shift east 700mm to allow POS to have north facing frontage.

With the above design change, the POS on level 20 and 21 receives 1 hour and 50mins of 1sqm direct solar between 1:10pm and 3:00pm while the living rooms receive 50 mins of direct solar between 2:10pm and 3:00pm.



	Proposed	
	Living room	POS
1:00 pm	No solar access	0.79sqm
1:05 pm	No solar access	0.83sqm
1:10 pm	No solar access	1 sqm+
1:30 pm	No solar access	1 sqm+
1:35 pm	No solar access	1 sqm+
1:40 pm	No solar access	1 sqm+
1:45 pm	No solar access	1 sqm+
1:50 pm	No solar access	1 sqm+
1:55 pm	0.06sqm	1 sqm+
2:00 pm	0.52sqm	1 sqm+
2:05 pm	0.87sqm	1 sqm+
2:10 pm	1 sqm+	1 sqm+
2:30 pm	1 sqm+	1 sqm+
2:35 pm	1 sqm+	1 sqm+
2:40 pm	1 sqm+	1 sqm+
2:45 pm	1 sqm+	1 sqm+
3:00 pm	1 sqm+	1 sqm+

Walsh Analysis method adopted for above measurement

APPENDIX

APPENDIX

ALTERNATIVE OPTIONS EXPLORATION

The following pages outline the alternative options explored in pursuit of maximising solar access to the living room and POS of apartments in accordance with the objectives of ADG.

The alternative options explored include:

- Planning change to maximise the number of north facing apartments and
- Alternative apartment layout options to the south east apartments

These options were explored and discounted due to the reasons outlined below:

- Failed to achieve better solar access to apartments than the proposed
- Detrimental impact to apartment layout and functionality, architectural expression, public domain amenity and overall urban experience and outcome.

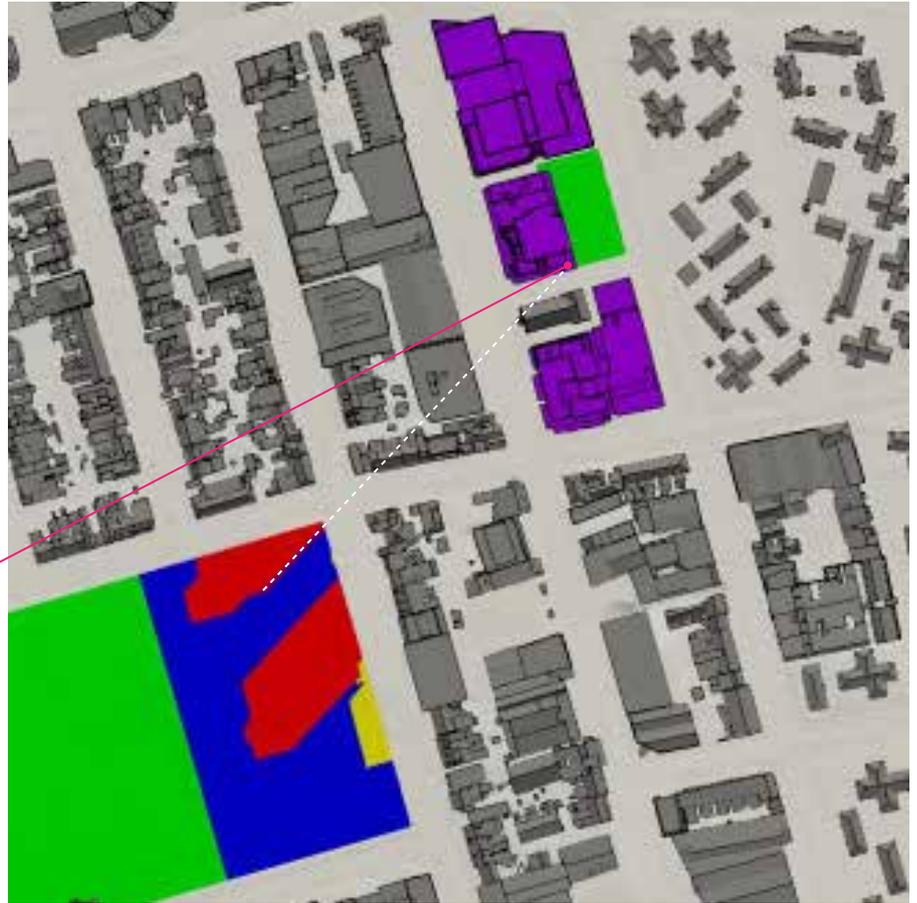
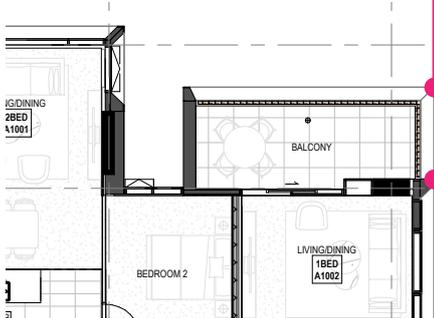
ALTERNATIVE OPTIONS

SOUTH EAST APARTMENT

South East Apartment Alternative Options Considerations

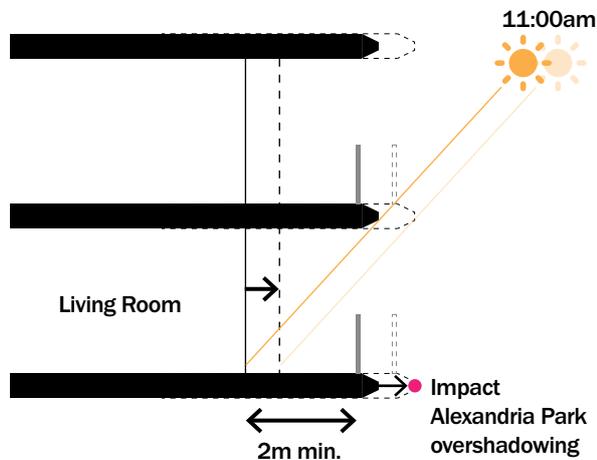
The design of the south east apartment considers a number of constraints including impact to Alexandria Overshadowing and POS depth.

Critical points impacting Alexandria Park overshadowing. Further east the points, more overshadowing impact to Alexandria Park.



For the living room of the south east apartment to comply with the 1sqm requirement at 11am mid winter it will require the living room facade to move further east, reducing POS depth to below ADG minimum.

Due to impact to Alexandria Park overshadowing, the south east POS edge can not move further east.



ALTERNATIVE OPTIONS

SOUTH EAST APARTMENT

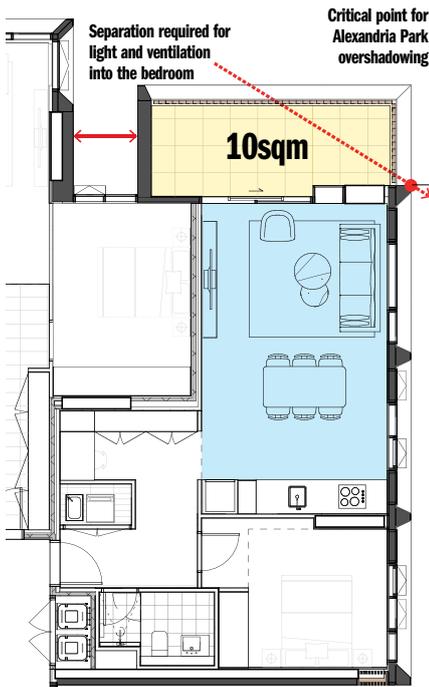
South East Apartment Alternative Options

Alternative planning options were considered and discounted due to detrimental impact on apartment layout and functionality, as well as overshadowing impact to Alexandria Park.

Alternative option 1 and option 2 achieves 2 hours of direct solar to living room and POS between 9:00am and 11:00am, extending the solar access to the living room by 12mins mid winter.

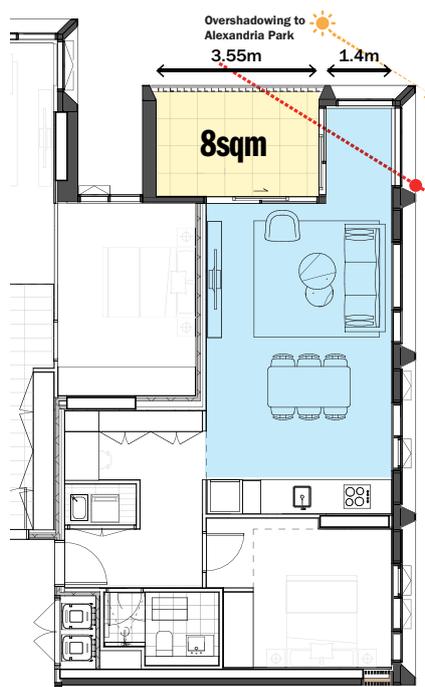
However, the planning of alternative option 1 and option 2 is detrimentally impacted as a result of reduction in POS size and functionality of living room.

Alternative option 1 and option 2 will result in increased overshadowing to Alexandria Park given the additional building mass that extends beyond the critical point for Alexandria Park overshadowing.



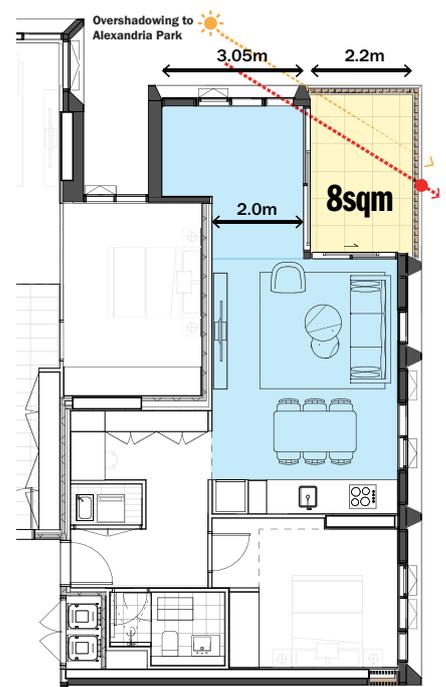
DA as submitted

- _Generous POS area
- _Generous and functional internal layout



Alternative option 01

- _Increased overshadowing to Alexandria Park
- _Reduce POS to be minimum ADG requirement
- _Small space to the south of POS that receives sun between 9am-11am.
- _Detrimental impact to facade architecture



Alternative option 02

- _Increased overshadowing to Alexandria Park
- _Relocate POS to the south to allow living to extend to the east facade
- _Main living area reduced in size
- _Small space which is disconnected from the main living is not functional.
- _Detrimental impact to facade architecture

ALTERNATIVE OPTIONS

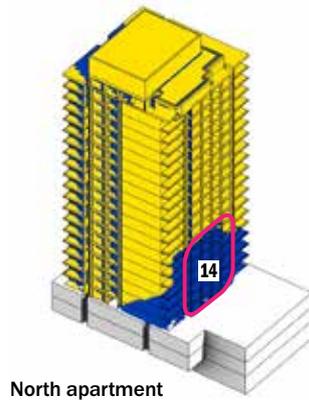
NORTH FACING APARTMENT SUMMARY

The below outlines an alternative planning option explored and discounted as it provides a less solar amenity than the proposal.

Option 1 - Maximising North Facing Apartments

_Option 1 maximises the number of north facing apartments. The lower levels of the northern facade are however overshadowed by the adjacent commercial building, which creates 14 additional overshadowed north facing apartments compared to Option 2

_Due to the uplift in the number of non compliant north facing apartments. Option 1 only provides an additional 7 apartments that achieve compliance with solar access design criteria compared to DA scheme.



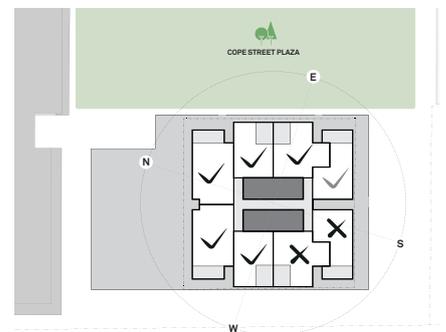
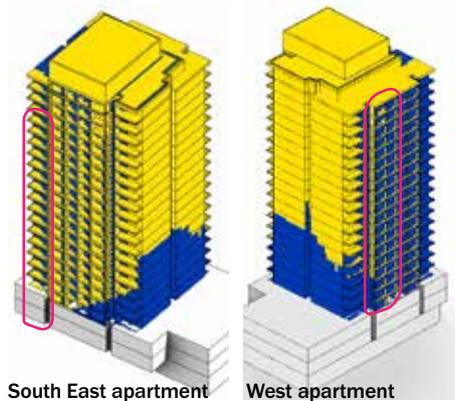
North facing apartments option **48%**

North facing apartments option + improvements to south east apartment (typical) **61%**

Option 2 - Improve solar access to south east and west apartments

_Option 2 explores opportunities to uplift solar amenity on a number of apartments on the east, south east and western elevation, which will result in a higher degree of solar compliance compared to option 1.

_Option 2 also provides a balanced amenity outcome that takes into account the importance of creating functional apartment layout, good public domain amenity and urban experience.



Modified highrise east apartments **46%**

Modified highrise east apartments + west apartments + improvements to south east apartments **68%**

ALTERNATIVE EXPLORED

KEY CONSIDERATIONS

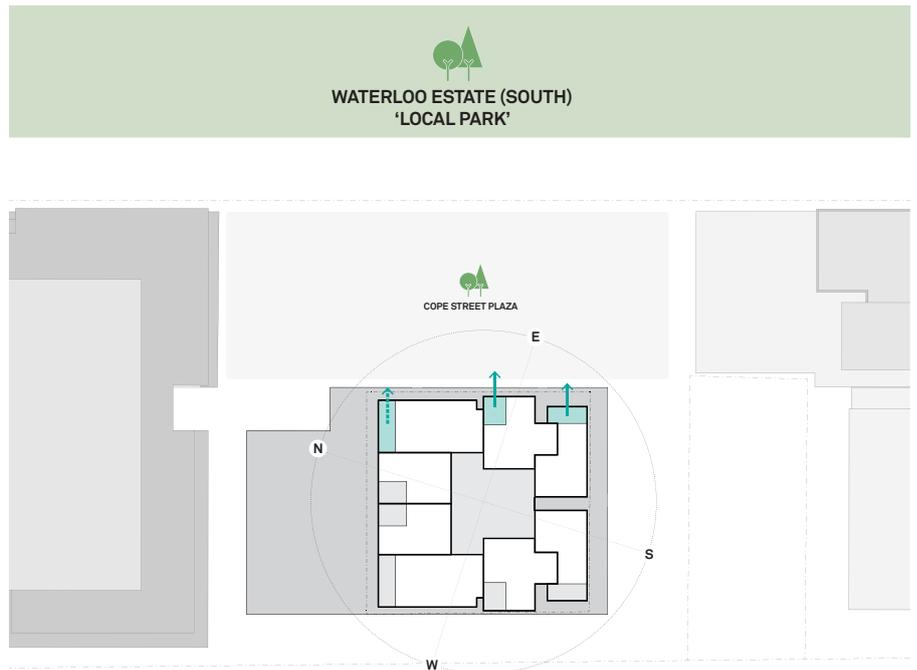
Privacy, View & Activation

Option 1

_Maximises north facing apartments overlooked by commercial building

_36 (24%) more apartments with single aspect view looking directly at commercial building to the North compared to Option 2

_Option 1 layout has a reduced number of apartments and balconies facing Cope Street Plaza, reducing the level of activation and vibrancy of the public domain.

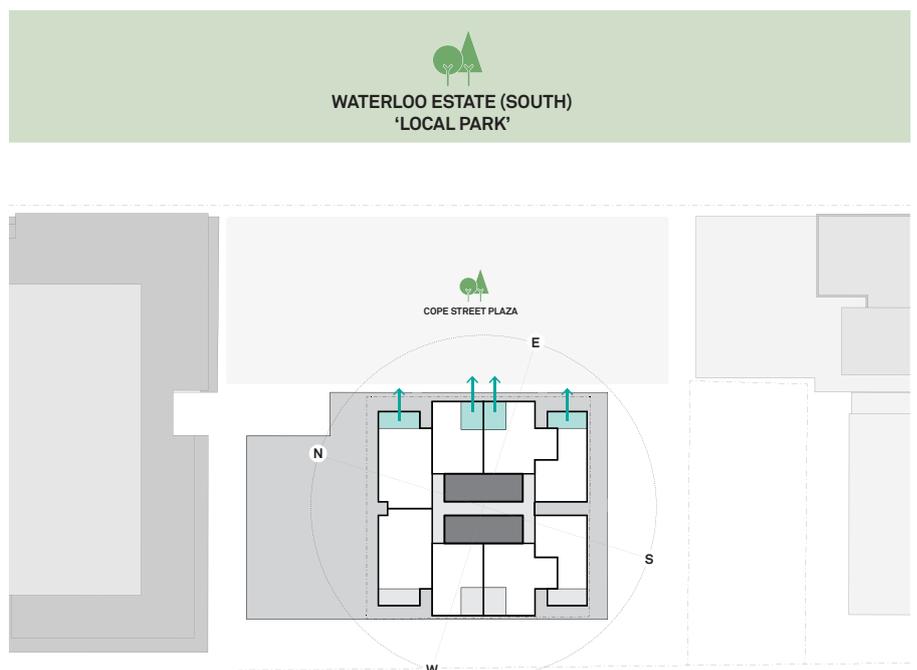


Option 2

_Minimises living and POS areas facing north to maximise privacy from commercial building.

_Maximises east facing apartments with access to views and no overlooking from neighbours. 76 apartments enjoy the east view towards the future parklands

_Maximises east facing apartments to create additional activation to Cope Street Plaza



ALTERNATIVE EXPLORED

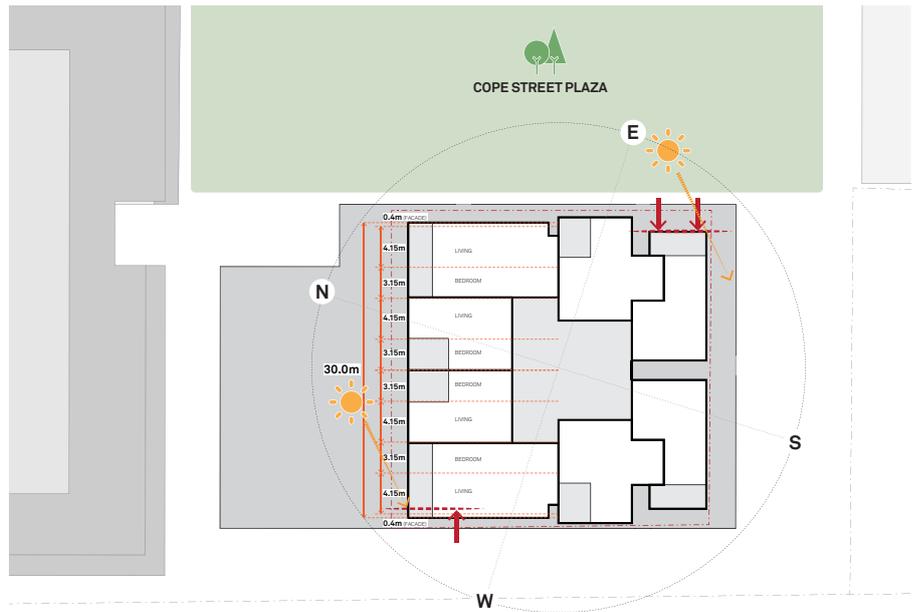
KEY CONSIDERATIONS

Alexandria Park Overshadowing

Option 1

_To satisfy the ADG minimum room dimensions requirement, the minimum building width on the north facade in Option 1 needs to be 30m.

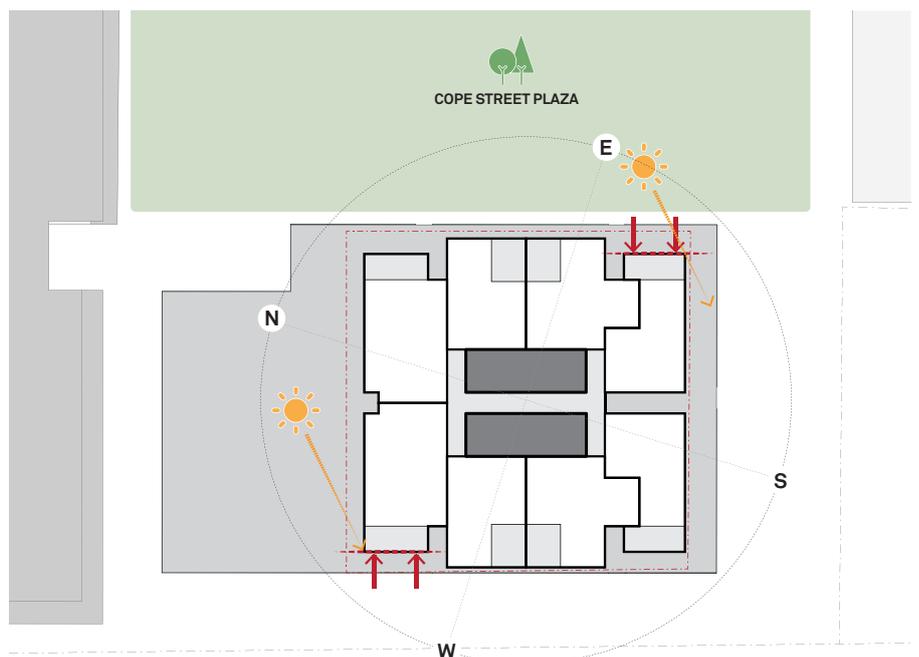
_In this scheme, to minimise overshadowing to Alexandria Park, it would mean that there is no allowance for building articulation on the northern facade, resulting in a wide and flat elevation.



Option 2

_Option 2 massing and building articulation are designed to minimise overshadowing to Alexandria Park.

_The NW/SE corners are setback to maximise the amount of direct solar access to Alexandria Park in mid winter.



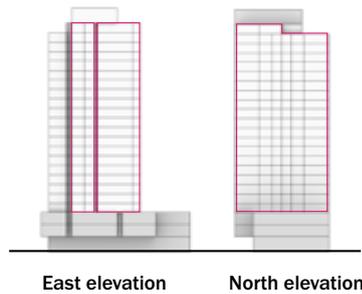
ALTERNATIVE EXPLORED

KEY CONSIDERATIONS

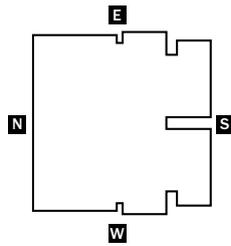
Building Expression & Articulation

Option 1

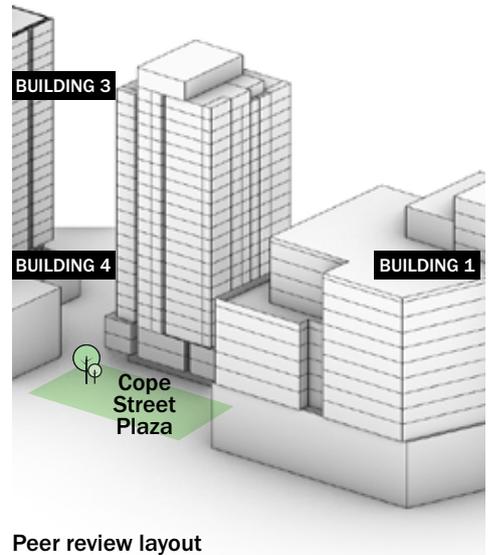
_Due to the requirement to minimise overshadowing to Alexandria Park and by locating 4 north facing apartments in option 1, there is no allowance for articulation to the north facade. As illustrated in the diagrams above.



East elevation North elevation



Plan outline

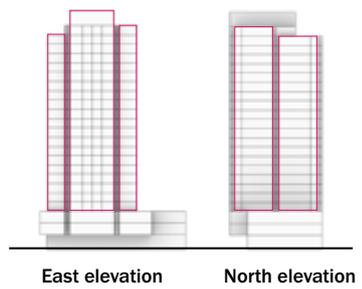


Peer review layout

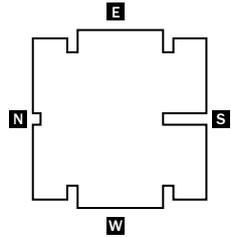
Option 2

_Option 2 introduces breaks/setbacks in the massing to create a high quality built form, emphasising a slenderness to the massing.

_By maximising east facing apartments, this maximises the number of POS and living rooms that face onto the plaza rather than toward the commercial building 1, allowing stronger view aspects for the apartments while providing additional activation to the public domain.



East elevation North elevation



Plan outline

