

Appendix D – Environmental Risk Assessment

An Environmental Risk Assessment determines residual risk by reviewing the significance of environmental impacts and the ability to manage those impacts. The Environmental Risk Assessment for the proposed development is derived from Australian Standard AS4369.1999 Risk Management and Environmental Risk Tools.

This section includes an environmental risk assessment to identify the potential environmental impacts associated with the development. The assessment covers the key issues identified in the SEARs and addressed in Section 6 of the EIS.

The level of risk has been determined by evaluating the likelihood of an impact and the consequence of an impact. The risk level is used to assist in understanding the significance of the mitigation measures that have been recommended and will be implemented.

Once the mitigation measure have been adopted a residual impact has been determined.

The Environmental Risk Assessment addresses:

- the adequacy of baseline data;
- the potential cumulative impacts due to other development in the vicinity; and
- measures to avoid, minimise and if necessary, offset the predicted impacts, including detailed contingency plans for managing any significant risks to the environment.

The Risk Assessment is based on qualitative measures of likelihood and consequence or impact as detailed in the following tables. These measures are assessed concurrently to determine the level of risk.

The Risk Assessment Table identifies the residual risk after mitigation measures have been implemented (including measures implemented into the building design). Further details of the mitigation measures (excluding those measures that form part of the building design) are provided in Appendix D.

Qualitative measures of likelihood

Likelihood		
A	Almost certain	Is expected to occur
B	Likely	Will probably occur
C	Possible	Might occur at some time
D	Unlikely	Could occur at some time
E	Rare	May only occur in exceptional circumstances

Qualitative Measures of Consequence or Impact

Consequence or Impact	
1	Insignificant
2	Minor
3	Moderate
4	Major
5	Catastrophic

Level of Risk Matrix

Likelihood	Consequence				
	1 - Insignificant	2 - Minor	3 - Moderate	4 - Major	5- Catastrophic
A -Almost Certain	High	High	Very High	Very High	Very High
B -Likely	Medium	High	High	Very High	Very High
C -Moderate	Low	Medium	High	Very High	Very High
D -Unlikely	Low	Low	Medium	High	Very High
E -Rare	Low	Low	Medium	High	High

Cst - Construction

Op - Operation

Potential Impact	Phase	Likelihood	Consequence	Risk Level prior to mitigation measure	Mitigation Measures to address risk (including measures incorporated into the design)	Residual Impact with Mitigation Measure
Built Form						
The building may have an adverse impact on views from key vantage points and view corridors to the Nepean River and the Blue Mountains.	Op	C	3	High	A Design Competition and Design Integrity Process was undertaken to ensure the final design of the building achieves design excellence. The final form of the building has been simplified and refined. The Visual Impact Analysis (Appendix P) demonstrates the building will not result in an adverse impact on important view corridors.	Nil
The signage of the development may result in an adverse visual impact on the local skyline, important views and vistas, the public domain and the adjoining properties.	Op	C	3	High	A preliminary signage strategy accompanies the application which demonstrates that only low-level signage is proposed that has been integrated into the building and landscape design. The signage will not result in any adverse impacts on the local skyline or important views and vistas. The signage will not result in any adverse impact on the surrounding properties or the public domain. A detailed signage strategy will be prepared prior to the issue of the Construction Certificate.	Nil
If not properly designed and managed the building design may provide opportunities for crime.	Op	B	4	Very High	The development includes a range of measures to reduce the potential for crime: <ul style="list-style-type: none"> As detailed in the Operational Management Plan the development will include a security control room. Security personnel will be on site 24 hours a day, 7 days a week and will 	Low

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					<p>be responsible for performing periodic patrols of the internal and external areas within the site. The external surrounding areas of WSW will also be monitored by CCTV.</p> <ul style="list-style-type: none"> • All WSW service routes, including the car park, will be access controlled (boom gate system) and managed by security personnel. • Access to the basement is provided by a singular vehicular ingress/egress driveway from Wilson Lane. The WSW security will manage the carpark with the following systems: <ul style="list-style-type: none"> • Automated Access control system; • Parking Management Software; • Automated Ticketing systems; • Video Surveillance system; and • Automatic Number Plate Recognition Readers (ANPR) • Access to all areas of the WSW will be monitored and controlled. • The lighting design is consistent with CPTED principles which focus on illumination to facilitate surveillance of the development and surrounds. 	

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					The CPTED report recommends a range of strategies to reduce crime risk which will be implemented (Appendix R).	
Service zones may result in adverse visual impacts on the public domain.	Op	C	2	Medium	The building has been designed so that all service vehicle access the site via the driveway from Wilson Lane. The porte cochere has been incorporated into a tunnel with landscaping above to soften views of the entrance from Wilson Lane. As such, the visual impact of the service zones on the public domain, particularly on Tench Avenue and Jamison Road has been minimised.	Nil
Service zones may result in adverse safety impacts on the public domain.	Op	D	5	Very High	All servicing will occur in loading areas in the basement and all service vehicles will leave the site in a forward direction.	Nil
Public domain and landscaping						
The development may require the removal of, or cause damage to, the trees on the adjoining properties.	Cst	D	4	High	An AIA and TMP has been prepared to assess the impact of the proposed development on the trees on the adjoining properties. The trees on the adjoining property to the south can be retained, subject to the implementation of the tree protection measures outlined in the TMP (Appendix T). The trees on the property adjoining Wilson Lane to the east are nominated for retention. These trees may not however survive due to the construction of the road. Consent has been obtained from the owners of the neighbouring property for the removal of these trees if required.	Low

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Environmental Amenity						
Building may adversely impact on the amenity of the adjoining properties due to overshadowing.	Op	D	2	Low	The building has been designed to ensure that all surrounding properties receive at least 3 hours of sunlight to northern façade.	
Noise impacts on the surrounding properties during construction.	Cst	A	3	Very High	The recommendations of the Noise Impact Assessment will be implemented (Appendix X)	Low
Acoustic impacts on the surrounding properties during operation.	Op	C	4	Very High	The building will be insulated to reduce noise transmission and mechanical plant will be selected so that there will be no noise impact on the surrounding properties. The NIA recommends mitigation measures to limit the acoustic impacts of the development on the surrounding properties. The measures will be implemented. Mitigation measures may be installed on the adjoining property to the east to address road noise. Owners consent for these works have been obtained.	Low.
The development will result in adverse reflectivity impacts.	Op	C	4	Very High	The recommendations of the Façade Reflectivity Report will be implemented (Appendix AM).	Low
The external lighting may adversely impact the surrounding property owners.	Op	C	3	High	The lighting design will be undertaken in accordance with the Lighting Design Report (Appendix AL).	Low

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ESD						
The development will use substantial amounts of water and energy to create snow and maintain an appropriate temperature.	Op	C	4	Very High	ESD principles have been incorporated into the design as detailed in the Architecture and Urban Design Report (Appendix H). The recommendations of the ESD Report prepared by Atelier 10 will be implemented (Appendix Z) and the building will achieve a 5 Star Green Building Rating.	Low
SIA						
The development may result in adverse impacts on the local community.	Op	D	3	Medium	The development will encourage community interaction and physical activity and will generate employment and tourism to the area. Ongoing consultation will be carried out with the adjoining Nepean Shores development to ensure any impacts which may arise are appropriately addressed.	Nil. The development will result in a positive impact on the community.
Biodiversity						
The development may result in adverse impacts on local the biodiversity.	Cst/Op	E	2	Low	A BDAR Waiver has been granted and a detailed landscape plan has been prepared that incorporates an extensive variety of indigenous spaces (Appendix I). A number of Camphor Laurel Trees which are a noxious weed will be removed.	Nil. The development will result in a positive impact on local biodiversity.
Water and soil quality						
The development may result in adverse impacts on soil, groundwater and rivers.	Cst/Op	D	2	Low	The recommendations of the PGR prepared by Broadcrest will be implemented (Appendix AI).	Nil

Potential Impact	Phase	Likelihood	Consequence	Risk Level prior to mitigation measure	Mitigation Measures to address risk (including measures incorporated into the design)	Residual Impact with Mitigation Measure
					Soil and erosion control measures will be implemented as detailed on the plan prepared by JWP (Appendix AF).	
Flooding and drainage						
The development will result in adverse flooding impacts downstream or on the surrounding properties.	Op	C	4	High	The underpass to allow the overland flow to convey underneath the building generally results in no adverse flood impact within the floodplain in the design events (i.e. up to the 1% AEP event) as detailed in Appendix AG .	Nil
Visitors to the centre may need to be evacuated during a flood event.	Op	C	4	Very High	A Flood Evacuation Strategy has been prepared by JWP (Appendix AG) and will be implemented as detailed in the Mitigation Measures Table (Appendix E).	Low
Contamination						
The site may be contaminated and unsuitable for the proposed use.	Op	C	4	Very High	The recommendations of the PDSI prepared by Broadcrest Consulting will be implemented (Appendix AJ).	Nil. The site will be made suitable for the proposed use.
Transport						
The local road network will not be able to accommodate the additional traffic generated by the development.	Op	D	3	Medium	The TIA prepared by PTC (Appendix AC) addresses the traffic impact of the proposed development. No additional mitigation measures are recommended other than road upgrade works along Mulgoa Road that are already planned for future upgrades.	Low
Construction						

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The safety and amenity of the public domain may be adversely impacted by the proposed development.	Cst	C	5	Very High	The Construction works will be managed in accordance with the CTPMP prepared by PTC (Appendix AT). A final CTPMP is to be prepared prior to the commencement of works. The development will also be managed in accordance with the Construction Management Plan prepared by Barker Ryan Stewart (Appendix U).	Low
The construction of the development may result in dust, air and odour impacts.	Cst	C	3	High	The control measures outlined in the Preliminary Construction Management Plan prepared by Barker Ryan Stewart will be implemented (Appendix U)	Low
Servicing and Waste						
Excessive waste may be generated during construction.	Cst	C	3	High	Waste generated during demolition and will be managed in accordance with the WMP prepared by Barker, Ryan Stewart (Appendix AN).	Nil. All waste will be managed in accordance with the WMP.
Waste may not be appropriately managed during operation.	Op	C	3	High	Waste generated during operation will be managed in accordance with the WMP prepared by Barker, Ryan Stewart (Appendix AN).	Nil. All waste will be managed in accordance with the WMP.
Heritage and Archaeology						
The development may result in adverse impacts on the heritage items in the vicinity of the site.	Op	E	2	Low	The SOHI prepared by Graham Hall and partners confirms no mitigation measures are required (Appendix V).	Nil

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Aboriginal Cultural Heritage						
The development may adversely impact on Aboriginal cultural heritage values.	Cst	C	3	High	The recommendations of the ACHAR prepared by Comber Architects will be implemented to confirm the presence of Aboriginal objects on the site and if objects are found the objects are appropriately excavated.	Low
Utilities						
The existing infrastructure may not be adequate to meet the demands of the development.	Op	C	4	Very High	Utilities will be provided as detailed in the Utilities report prepared by JWP (Appendix AH).	Nil. The required utilities can be provided.
Bushfire						
The bushfire hazard on the site may not be properly managed.	Op	D	4	High	The recommendations of the Bushfire Assessment Report will be implemented (Appendix AE).	Low