

APPENDIX B – ENVIRONMENTAL RISK ASSESSMENT AND MITIGATION MEASURES

The following section provides recommendation for mitigation measures in response to potential impacts identified in Section 6 of the EIS. The structure of mitigation measures is based on the DPHI’s hierarchy of approaches for managing impacts identified in the *State Significant Development Guidelines: Preparing an Environmental Impact Statement (July 2022)*, as:

- **Performance based measure** – identify performance criteria that must be complied with to achieve an appropriate environmental outcome but do not specify how the outcome is to be achieved.
- **Prescriptive measure** – require action to be taken or specify something that must not be done.
- **Management based measure** – identify one or more management objectives that must be achieved through the implementation of a management plan.

Following the implementation of appropriate mitigation measures as recommended, it is determined that the proposal will not result in any significant adverse impacts on the surrounding environment. The following table illustrates how the matters raised within the SEARs will be addressed. This analysis comprises a qualitative assessment consistent with AS/NZS ISO 31000:2009 Risk Management–Principles and Guidelines (Standards Australia 2009). The level of risk was assessed by considering the potential impacts of the proposed development prior to application of any mitigation or management measures. In accordance with the SEARs, the Environmental Risk Assessment (ERA) addresses the following significant risk issues:

- The adequacy of baseline data;
- The potential cumulative impacts arising from other developments in the vicinity of the site; and
- Measures to avoid, minimise, offset the predicted impacts where necessary involving the preparation of detailed contingency plans for managing any significant risk to the environment.

Risk comprises the likelihood of an event occurring and the consequences of that event. For the proposal, the following descriptors were adopted for ‘likelihood’ and ‘consequence’.

Likelihood		Consequence	
A	Almost certain	1	Widespread and/or irreversible impact
B	Likely	2	Extensive but reversible (within 2 years) impact or irreversible local impact
C	Possible	3	Local, acceptable or reversible impact
D	Unlikely	4	Local, reversible, short term (<3 months) impact
E	Rare	5	Local, reversible, short term (<1 month) impact

The risk levels for likely and potential impacts were derived using the following risk matrix.

		LIKELIHOOD				
		A	B	C	D	E
CONSEQUENCE	1	High	High	Medium	Low	Very low
	2	High	High	Medium	Low	Very low
	3	Medium	Medium	Medium	Low	Very low
	4	Low	Low	Low	Low	Very low
	5	Very low	Very low	Very low	Very low	Very low

The results of the environmental risk assessment for the proposed development are presented in the below table and are based upon the range of technical and specialist consultant reports appended to the EIS. The table has directly related mitigation measures responding to each impact also based upon the range of technical and specialist consultant reports appended to the EIS.

N.B. ‘O’ – Operational; ‘C’ – Construction

‘Pe’ – Performance based mitigation measure; ‘Pr’ – Prescriptive based mitigation measure ‘Ma’ – Management based mitigation measure

SEARS	Potential Impact	Stage of Project	Likelihood	Consequence	Risk Level	Approach	Mitigation Measure (Pe/Pr/Ma)	Residual Impact
Traffic and Transport	Impacts on road network, surrounding land uses and the community generally as a result of the proposal.	C and	C	5	Low	Construction Traffic A preliminary Construction Traffic Management Plan (CTMP) will be prepared and provided as part of the future Detailed SSDA, which will be updated prior to the commencement of any works on the Concept Development Area and this can be reinforced via a suitable worded condition of consent. It is anticipated that the preliminary CTMP would include standard mitigation measures which would include the following: - Trucks to minimise the use of local streets for access to the construction site. - Trucks to enter and exit the site in a forward direction. - Pedestrians near the ingress/egress points will not be held unnecessarily. - Trucks to not circulate on the road network to wait to enter the site (unless exceptional circumstances do not permit). - Restrict construction vehicle activity to designated routes which do not utilise any local roads. - Truck drivers will be advised of the designated truck routes to/ from the site. - Pedestrian movements adjacent the construction site will be managed and controlled by site personnel where required. - Pedestrian warning signs and construction safety signs/devices to be utilised in the vicinity of the site and to be provided in accordance with Work Cover requirements. - Construction activity to be carried out in accordance with approved hours of work. - Truck loads would be covered during transportation off-site. - Establishment and enforcement of appropriate on-site vehicle speed limits which would be reviewed depending on weather conditions or safety requirements. - Activities related to the construction works would not impede traffic flow along adjacent roads. - Materials would be delivered and spoil removed during standard construction hours. - Construction vehicles not to queue on adjacent streets. - During site induction, workers will be informed of the existing bus and metro network servicing the site. - To support construction workers in utilising public transport, appropriate arrangements will be made for any equipment/ tool storage and drop-off requirements; and Development and enforcement of driver charter. Operational Traffic The Transport Impact Assessment (Appendix R) concludes that the traffic impacts of the proposal are acceptable with no further traffic mitigation works required to respond to the resultant intersection performance and queuing. Notwithstanding, A Green Travel Plan (GTP) will be prepared prior to the operation of the development, anticipated to be progressed as part of a future Detailed SSDA. A preliminary GTP has been prepared by JMT Consulting and is provided at Appendix R. The preliminary GTP identifies measures and initiatives which could be included as part of the GTP in alignment with the Detailed SSDA, including: - Travel Access Guide - Public Transport Information - Active Transport Facilities - Car Pooling registry/forum - Mode share targets - Management and monitoring methodology - Establishment of a Travel Plan Coordinator	Pr, Ma	Low

SEARS	Potential Impact	Stage of Project	Likelihood	Consequence	Risk Level	Approach	Mitigation Measure (Pe/Pr/Ma)	Residual Impact
Aboriginal Cultural Heritage	Impacts on potential Aboriginal heritage artifacts found or disturbed during demolition and construction on the Concept Development Area, subject to the future, Detailed SSDA.	C and O	C	3	Low	The ACHAR identifies management measures which will be referred to and addressed as part of any future, detailed development application and subsequent detailed design phases as to mitigate harm to any Aboriginal objects and values. An overview of the recommendations are as follows, with further detail provided at Appendix BB: ▪ Aboriginal Archaeological Test Excavation Conduct test excavations to determine the nature, extent, and significance of any sub-surface Aboriginal objects and resources. Prepare the Archaeological Research Design (ARD) during the detailed SSDA phase, ensuring compliance with Heritage NSW and statutory obligations, and coordinate with historical archaeological investigations. ▪ Archaeological Monitoring Undertake archaeological monitoring during pre-remediation investigations to identify subsurface archaeological material early and manage heritage values adaptively. If archaeological material is found, halt further disturbance and have a qualified archaeologist assess the find, with monitoring including the presence of project RAPs. ▪ Aboriginal Cultural Heritage Induction Provide a site induction to all employees and contractors, covering types of sites to be aware of, obligations under the NPW Act, and the requirements of an archaeological finds procedure. ▪ Aboriginal Heritage Interpretation Develop and implement an Aboriginal Heritage Interpretation Plan, involving consultation with project RAPs and considering key themes from the Umwelt Social Assessment. Celebrate the rich traditions of Aboriginal people specific to the study area and incorporate any archaeological finds from future excavations. ▪ Aboriginal Unexpected Finds Procedure If an Aboriginal Unexpected Find is discovered, cease works, contact the project archaeologist to verify the find, and notify project RAPs and Heritage NSW if confirmed. Formulate and implement an archaeological or heritage management plan before resuming works. ▪ Human Remains Procedure If potential human remains are discovered, cease all work at the location, secure the area, notify local police and Heritage NSW Environment Hotline, and do not recommence work unless authorised in writing by Heritage NSW. ▪ Aboriginal Community Involvement Update and reassess the impact assessment if the project design changes, allowing for additional RAP feedback. Provide RAPs with the ARD and opportunities to be involved in the development and finalisation of interpretative elements for the project.	Pr, Ma	Low
Archaeological Assessment	Potential to uncover archaeological artefacts during excavation	C	C	3	Low	A Research Design and Excavation Methodology (Appendix DDi) has been prepared and is submitted as part of the Concept SSDA, as per the SEARs requirements. This will guide the archaeological test excavations required for the site. Overall, the following mitigation measures are proposed in support of the Concept SSDA and any physical works associated with the future, detailed development application: ▪ Archaeological Test Excavation: It is recommended that archaeological test excavations be undertaken via a staged approach throughout the duration of the project. Initial sample testing is proposed to be carried out within the south-western boundary of the study area, where Phase 2 (c.1889–c.1939) development has been identified as having moderate to high archaeological potential. Undertaking these works early will allow findings to be documented and reported prior to the Stage 1 (Concept) SSDA determination. Excavation works under Stage 1 will require a Section 60 Excavation Permit. Future archaeological investigations should be	Pr, Ma	Low

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						conducted post Concept approval and as a part of the Stage 2 (Detailed) SSDA preparation. Test excavations should be undertaken in accordance with the proposed methodology (Appendix: Archaeological Research Design & Excavation Methodology) by appropriately qualified archaeologists. ▪ Archaeological Monitoring: Implement archaeological monitoring during pre-remediation investigations to identify and document subsurface archaeological material, allowing for adaptive management without delaying works. ▪ Archaeological Heritage Induction: Prepare and present a heritage induction document/presentation to all relevant on-site personnel, detailing the site's potential archaeological resources, processes, and the Unexpected Finds Procedure. ▪ Unexpected Finds Protocol: Establish an Unexpected Finds Procedure to cease works immediately if suspected relics are found, notify Heritage NSW, and implement an archaeological/heritage management plan before resuming works.		
Noise and Vibration	Noise emissions from the operation of the indicative reference scheme and resulting impacts of exceeding accpetable noise levels.	O	C	4	Low	The following design measures have been identified as part of the Acoustic Assessment (Appendix U) which will be considered as part of a future detailed SSDA and subsequent detailed design phases (which would included detailed design for mechanical services) to ensure the aggregate noise level from all external emissions, associated with the prpoosed land use comply with the applicable noise level criteria. Mechanical Plant ▪ Mechanical plant installation locations and the positioning of external air duct paths (such as inlets and outlets) near the property boundary should be limited, as far as practicable. ▪ Plant room walls should achieve a minimum airborne sound insulation performance of Rw 45 -50. Whenever possible, the plant rooms should only be accessible from inside the building. ▪ If airflow paths are required to/from outside (such as outside air, exhaust air, relief air, etc) these paths should be fully ducted and include minimum 50 mm thick internal insulation; and / or include acoustic louvres. When the extent of ductwork is not sufficient for treatment, then rectangular silencers may be required (this especially applies to fans and AHUs). ▪ Ornamental louvres should generally only be considered if they are blanked off with FC sheeting or plant room external walls (subject to a further detailed acoustic assessment). ▪ All plant room walls and roof / ceiling to be internally lined with insulation, which in combination with insulation facing, should achieve a minimum noise reduction coefficient (NRC) rating of 0.8. ▪ AHUs and FCUs should include return air / outside air plenums which are in internally lined with minimum 50 mm thick insulation. ▪ Variable speed drives should be implemented whenever possible. ▪ Reduce the number of operational plant items between 6:00 pm and 7:00 am (and during the night-time period generally). ▪ Outdoor units and other plant items to be screened from direct line of sight to the affected residences (depending on their locations). ▪ Stand-by generators should be acoustically treated to achieve the external noise level criteria, by accounting the modifying factors for maintenance operations. The treatment is likely to comprise an acoustic enclosure, rectangular silencers / louvres for air intakes and air discharge paths; and mufflers on the exhaust. Architectural Treatments – Building Envelope The following is conceptually advised for bedrooms and war areas to be further developed as part of a future detailed SSDA and subsequent detailed design phases: ▪ Façade glazing should achieve a minimum sound insulation performance of Rw 36-37. Product example: 10.38mm or 12.38mm laminated glass panels.	Pr, Ma	Low

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						- Non-glazed façade elements should achieve a minimum sound insulation performance of Rw 45-50. - Roof should comprise a concrete slab with a minimum thickness of 200mm and a minimum density of 2400 kg/m3. Traffic and Loading The following is conceptually advised for bedrooms and war areas to be further developed as part of a future detailed SSDA and subsequent detailed design phases: - Entry and exit routes, to and from the carpark and the loading dock, are in direct line of sight to residential areas at St John's College. Therefore, noise emissions from these routes should be assessed to confirm compliance with the relevant criteria. - To mitigate the impact of sleep arousal and sleep awakening onto nearest residential receivers, the use of the loading dock should be limited to daytime and evening periods (i.e. between 7:00 am and 10:00 pm). Noise emissions from the loading dock should be assessed to confirm compliance with the relevant criteria. - If certain vehicle types are required to use the loading dock at anytime (such as ambulances), then noise emissions from respective vehicular movements should be assessed accordingly to confirm compliance with operational criteria as well as to address the likelihood of sleep disturbance. These procedures might include the following: - Restriction on the use of sirens when within the service road and loading dock. - Use of power tools, pressure washers and any other operational activity in the loading dock, should be limited to the daytime and evening period (i.e. between 7:00 am and 10:00 pm). Waste As part of future a future, detailed SSDA and the associated operations: - It is recommended that waste collection should only be conducted between 7:00 am and 10:00 pm to mitigate the impact of sleep disturbance or sleep awakening at nearest residential receiver		
Social Impacts	Disruption to neighbours and adjacent land users during the detailed desgin and operational phases of the project.	C and O	C	4	Low	As part of future a future, detailed SSDA and the associated operations, the Social Impact Assessment (Appendix EE) recommends the following mitigation and enhancement measures be considered in the early stages of the detailed desgin process: - Develop education / communication materials about road changes to improve local road safety (operation phase) - Collaboration between RPA Hospital and the Proponent on management of private patients (operation phase) - Collaboration between key anchor tenants and the Proponent regarding the provision, delivery and outcomes of research and medical facilities (operation phase). - Establishment of a collaborative working group to manage cumulative traffic impacts (operation phase). - Concept and detailed design considerations such as interaction between Project and street frontage, delivery of public domain, and intentional wayfinding (detailed design phase). - Inclusion of a community focused spaced within the Proposal, managed by the Proponent (detailed design phase). - Monitoring of ambulance response times to inform adaptive management approaches (operation phase). - Further engagement with key stakeholders to facilitate additional input to the detailed design process (detailed design phase).	Ma	Low

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						Active development and support for placement opportunities and pathways in allied health services (operation phase).		
Wind	Potential adverse wind strenght/movements as a result of the indicative reference scheme.	O	C	3	Low	The Environmental Wind Assessment Report (Appendix N) has identified, that as part of the qualitative assessment of the concept envelope, the following mitigation measure is recommended: Outdoor Seating Area – Missenden Road Wind conditions at Missenden Road could be improved with local amelioration such as temporary or permanent vertical screens, or planter boxes around the seating area. This mitigation easure will be considered as part of the relevant, qualitative wind impact assessment associated with the future, detailed SSDA.	Ma	Low
Waste Management	Potential impacts from waste generated during construction and operational phases.	C and O	C	4	Low	The Waste Management Plan identifies the following mitigation measures which will be further reflected and updated in support of the future detailed future, detailed SSDA, including: - Comprehensive protocols for the management of clinical and other wastes generated by the hospital and other medical tenancies: - The WMP identifies the equipment & storage space calculations and areas required for bulky waste items. - The WMP identifies the need to address Clinical Waste Management Protocols (in accordance with the NSW Health Clinical and Related Waste Management for Health Services Policy) - Detailed processes for the on-site management, storage, and collection of all hazardous and non-hazardous waste materials. This includes: - General Waste & Recycling Procedures - Operational Management Procedures - Descriptions of health and safety requirements appropriate to the development's operational characteristics. This includes - Workplace Health & Safety (in accordance with the NSW Health Clinical and Related Waste Management for Health Services Policy, August 2017 and the NSW Health Policy Directive Infection Prevention and Control Policy (PD2017_013)) - Suitable equipment for management of the development's operational general waste and recycling - The WMP identifies general requirements for internal bins - Education and engagement programs for staff and contractors to ensure ongoing effective waste management. This includes Staff and contractor requirements and education (noting the need to transport dangerous goods). - Ongoing target setting, management, monitoring, reporting, and continuous improvement processes. The WMP recommends that following implementation of the new systems, a monthly reporting system, based on the Better Buildings Partnership (BBP) Operational Waste Guidelines, is to be instituted. The WMP also identifies the following targets for operational resource recovery: - Year 1: 50% diversion/resource recovery - Year 2: 55% diversion/resource recovery - Year 3: 60% diversion/resource recovery	Pe, Ma	Low
Heritage	Impacts of the concept envelope and indicative reference scheme to surrounding built heritage including RPA Hospital and St John's College.	O	C	3	Low	The proposal has been carefully considered and reviewed and developed in conjunction with heritage advice in order to mitigate potential impacts to the heritage significance of St John's College and other items of state and local heritage significance surrounding the development site. The following recommendations are made for consideration in any future, detailed SSDA and any associated construction activities The Stage 2 detailed design should be developed in consultation with a heritage professional to mitigate potential impacts on the established setting of, and key views to, nearby historic buildings including St Johns College and RPA. This should include due regard for maintaining the pedestrian	Pe	Low

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						scale of built forms along Missenden Road, and consideration of form and materiality of the new development, to ensure a well-mannered backdrop to the College in principal views. Proposed new development should complement and not detract from the character of the locality. - A Photographic Archival Recording should be undertaken prior to the issue of a Construction Certificate and must be prepared in accordance with the NSW OEH Heritage Division's Guidelines for 'Photographic Recording of Heritage Items Using Film or Digital Capture'. - Prior to the issue of a Construction Certificate, a Protection Strategy should be developed for the duration of the construction works. The Strategy is to detail how the proposed works will ensure that the buildings at St John's College are to be suitably protected and stabilized during the construction process including from any construction waste, dust, damp, water runoff, vibration or structural disturbance or damage. The Protection Strategy should be prepared by the building contractor with input from a specialist heritage engineers and heritage consultant. - An interpretation plan must be submitted prior to the issue of a Construction Certificate. The interpretation plan must detail how information on the history and significance of the buildings of St John's College and their historic uses will be provided for the public and make recommendations regarding public accessibility, signage and lighting. Public art, details of the heritage design, the display of selected artefacts are some of the means that can be used.		
Contamination	Exposure of contamination of hazardous materials during construction following approval of a future detailed SSDA.	C	C	4	Low	Site Remediation The prepared RAP (Appendix W) identifies that the site can be made suitable for the proposed use via remediation and the implementation of the RAP, noting the following recommendations in support of the physical works to be undertaken as part of any future, detailed SSDA: - Remediate the site via a combination of excavation and off-site disposal of contaminated fill/soil to a suitably licensed landfill, and in-situ capping of fill in the areas outside the proposed basement footprint; - Validate the remediation process and imported materials; and - Prepare a Site Validation Report and long-term Environmental Management Plan (EMP) on completion of remediation. - The site validation report is to be prepared on completion of remediation activities and submitted to the consent authority to demonstrate that the site is suitable for the proposed development following completion of remediation/validation. - The EMP would also be prepared to manage the contaminated fill capped on site as part of the remediation. The EMP will provide a passive management approach and is not expected to impose onerous constraints on the day-to-day site use under the proposed development scenario.	Pr, Ma	Low
ESD	Potential increase in energy consumption associated with demolition, construction and operational phases of the development.	C and O	C	4	Low	The ESD Report (Appendix Q) identifies the following mitigation measures which are recommended to be incorporated into the future, detailed SSDA or the subsequent detailed design and construction phases: - High-performance façade system to reduce thermal loads and energy demand (design) - Installation of solar PV and heat pump systems to reduce operational emissions (design) - Use of low-flow water fixtures and potential for rainwater harvesting to reduce potable water use (design) - Provision of secure bicycle parking and end-of-trip facilities to encourage sustainable transport (design)	Pe	Low

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						▪ Selection of low-VOC, non-toxic, and recyclable materials to improve indoor environmental quality and reduce waste (design) ▪ Construction and demolition waste management plan targeting 80% landfill diversion (can be conditioned to be required prior to construction) ▪ Commissioning of building services and ongoing performance monitoring to ensure energy and water systems operate efficiently (can be conditioned to be required at detailed design phase) ▪ Landscaping using native, drought-tolerant species to reduce irrigation needs and support biodiversity (design)		
Arboricultural Impacts	Potential impacts to trees that will be retained and protected on the site.	C	C	4	Low	The following mitigation measures are recommended by the Arboricultural Impact Assessment to ensure that retained trees are appropriately protected as part of any physical works that will be sought under a future, detailed SSDA: ▪ All trees designated for retention must be preserved and protected to prevent unnecessary damage. This applies during both pre-construction and construction phases. ▪ Install Tree Protection fencing compliant with AS4970:2025 around all trees for retention before construction begins to safeguard them from harm. ▪ Erect Tree Protection signage compliant with AS4970:2025 around all trees for retention prior to construction to ensure awareness and protection. ▪ Commission a qualified "Project Arborist" to oversee tree protection measures, manage activities within Tree Protection Zones (TPZs), and certify compliance during construction. ▪ The Project Arborist must supervise any earthwork or service installation within the TPZs of trees to be retained to prevent damage. ▪ The Construction Manager must ensure that activities listed in Section 11.12 of the Arboricultural Impact Assessment (AIA) do not occur within the TPZs of trees to be retained. ▪ The Project Arborist is required to conduct monthly site visits, documenting compliance with photographic evidence throughout the construction phase. ▪ Plant 49 new trees on the site as per the Landscape Plans to mitigate the impact of the removal of 15 trees and to establish a new tree population for the future. This should be completed before occupation. ▪ Within 12 months of the commencement of operation, the Project Arborist must inspect and report on the condition of retained trees and the quality of new plantings to ensure their viability post-construction.	Pr, Ma	Low