

Appendix GG – Mitigation Measures Table

Impact / Risk	Mitigation Measure	Timing	Responsibility
General			
Contamination			
The land is (or is made) suitable for the proposed land use	Preparation of a Remediation Action Plan (RAP) for the proposed development. Site remediation and validation will be required in accordance with the RAP.	Prior to commencement of operation	Contractor
Contaminated soil management	A waste classification is required for any soil and/or bedrock excavated from the site prior to offsite disposal. Subject to the appropriate testing, material can be classified as Virgin Excavated Natural Material (VENM), Excavated Natural Material (ENM), General Solid, Restricted Solid or Hazardous Waste.	Construction	Contractor
Salinity			
Potential impacts of salinity upon the environment and development	A detailed salinity analysis and management plan will be required to avoid or mitigate the impacts of development on salinity processes to prevent any degradation in soils, groundwater or vegetation; damage to buildings and infrastructure; and ensure development will not significantly increase the salt load in existing watercourses, consistent with Council's requirements.	Prior to commencement of works	Contractor
Heritage			
Impacts upon undiscovered archaeological artefacts or archaeological potential	An unexpected finds protocol (with appropriate induction) will be in place during works to identify and protect any artefacts that may be discovered. The unexpected find protocol shall be documented in the Contractor's Construction Management Plan.	Construction	Contractor
	<p>Should a suspected archaeological relic be discovered during works, the Principal Contractor shall stop work in the area, notify the Project Manager and protect the find.</p> <p>The Principal Contractor is to engage an Aboriginal archaeologist to assess the find, commencing with submitting a photograph to undertake a preliminary assessment. The archaeologist may require a site visit to undertake further assessment.</p> <p>The Principal Contractor is to gain advice from the archaeologist on how to proceed. Subject to the archaeological assessment, work may proceed or notification to Heritage NSW, Department of Premier and Cabinet may be required.</p>		

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	<p>If an assessment (following notification) indicates that the material exposed is of State or local significance and requires management under the 'relics' provisions of the Heritage Act, the following steps are to be taken:</p> <ul style="list-style-type: none"> • Prepare an Archaeological Assessment and Research Design as a supporting document in order to obtain an Excavation Permit under Section 139 of the Heritage Act 1977. • Monitoring and/or salvage works (where appropriate) are to be carried out under the relevant conditions attached to the Excavation Permit. • A final report on the archaeological findings, if any, should be prepared at the completion of works. <p>In all cases, the Principal Contractor shall seek clearance to recommence the works.</p>		
Construction			
Hazardous building materials			
Identification of hazardous materials	<p>Prior to demolition or refurbishment work within the North Block, JK Environment's Hazardous Building Materials Survey must be provided to the demolition/building contractor.</p> <p>Completion of the hazardous materials survey of the internal areas must also occur.</p>	Prior to commencement of works	<p>Health Infrastructure</p> <p>Contractor</p>
Management of asbestos containing materials	<p>All works associated with the disturbance and removal of asbestos containing materials must be undertaken by a Licenced Class B Asbestos Removalist.</p> <p>The asbestos removalist must prepare an Asbestos Removal Control Plan for the proposed works. The Control Plan should include an allowance for both asbestos air fibre monitoring during the removal, and a thorough clean upon completion of the removal works.</p> <p>An Asbestos Management Plan must be prepared for the proposed works in areas containing asbestos.</p> <p>On completion of the works, a clearance inspection must be undertaken and a clearance certificate provided prior to construction activities recommencing in the affected area.</p> <p>If previously unidentified materials (suspected of containing asbestos) are identified during the demolition phase, works should cease within the localised affected area and the material inspected and classified by an experienced consultant. The area should be isolated and barricaded until the material has been classified as non-hazardous or removed.</p>	Prior to and during construction	Contractor

Impact / Risk	Mitigation Measure	Timing	Responsibility
	All asbestos containing materials must be removed in accordance with the relevant Regulations and Codes and by an experienced asbestos removal contractor.		
Management of lead paint surfaces	All identified lead containing paint must be removed / treated in accordance with the relevant Regulations and Codes and by an experienced hazardous materials removal contractor. Completion of a detailed survey in relation to lead paint must also occur.	Prior to commencement of works Construction	Contractor
Management of PCBs	PCBs are a scheduled waste with strict guidelines regarding transport and handling. PCB work is to be conducted in accordance with the Environmental Protection & Heritage Council's Polychlorinated Biphenyls Management Plan, Revised Edition April 2003. Details on storing, conveying and disposing of PCB material or PCB wastes are to be carried out in accordance with the Polychlorinated Biphenyls Management Plan, Environmental Protection & Heritage Council, Revised Edition April 2003.	Prior to and during construction	Contractor
Management of Synthetic Mineral Fibres (SMFs)	All SMF containing materials must be removed in accordance with the relevant National Standard and Codes and by an experienced hazardous materials removal contractor.	Construction	Contractor
Acid Sulfate Soils			
Potential impacts of acid sulfate soils upon the environment	An Acid Sulfate Soils Management Plan shall be prepared following specific geotechnical advice.	Prior to commencement of works	Contractor
Biodiversity loss and management			
Removal of Plant Community Type PCT 849 - Cumberland shale plains woodland	Offsetting shall be paid using the calculated ecosystem credits under the BAM-C Should construction planning determine the need for additional clearing of vegetation within mapped areas of PCT 849, revision of the BDAR would be required to determine if offsetting is adequate.	Prior to commencement of construction Prior to commencement of construction	Health Infrastructure Contractor
Manage risks to flora and fauna during construction activities	A flora and fauna sub-plan shall be provided with the CEMP. It will address protocols for vegetation clearing, hygiene, weed management, unexpected finds and inductions/ toolbox talks. It will outline the responsibilities for key staff including the Project Ecologist, Project Arborist, and subcontractors	Prior to commencement of construction	Contractor
Avoid spread of sediment into retained vegetation	Erosion and sediment control must be detailed in an Erosion and Sediment Management Plan sub plan and provided with the CEMP. This will include types of control, method of installation, locations, maintenance regime, responsibilities, and stockpile storage. Matters to be documented include, but are not limited to, silt fencing, vehicle shake-down, floating silt boom, and stabilisation access for machinery.	Prior to commencement of works	
Minimising impact to trees and vegetation	Disturbance of vegetation will be limited to the smallest degree possible to construct the project. All trees nominated for removal are to be clearly marked (with paint or flagging tape) by the Project Ecologist or Project Arborist prior to removal.	Prior to commencement of works Construction	

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	No rubbish, debris, or vegetation waste is to be placed in the retained vegetation. All waste and/or spoil must be stored in ancillary areas and removed from site to a suitably licenced waste facility.		
	Tree Protection Zones (TPZs) shall be installed around trees (over 100mm DBH (Diameter at Breast Height), or as otherwise specified by the Project Arborist) to be retained using appropriate demarcation in accordance with AS 4970-2009 Protection of Trees on Development Sites. Where TPZs are not feasible, alternative measures will be implemented including branch and trunk protection in consultation with the Project Arborist.		
Minimising impacts to fauna	Plant and equipment shall be turned off when not in use to avoid noise and air quality impacts to nearby fauna. A qualified and experienced Project Ecologist shall be engaged to inspect trees for fauna and relocate the fauna if required. This process will be documented for record keeping and be in accordance with the Biodiversity Guidelines (RTA 2011). If any fauna are identified during works and require rescue, the Project Ecologist, or fauna rescue volunteer shall be notified. Rescue volunteers include either Sydney Metro Wildlife on 9413 4300 or WIRES on 1300 094 737.	Construction	
Minimising spread of weeds	The Principal Contractor shall implement best practice for hygiene to prevent the spread of invasive weeds. This shall include inspecting vehicles and plant for mud and soils before entering and exiting the construction site. Stockpiles of materials containing invasive weed plant matter shall be covered and banded to prevent spread. The Principal Contractor is to manage biosecurity in accordance with: <ul style="list-style-type: none"> • Biosecurity Act 2015 (see NSW Weedwise). • Best practise bush regeneration techniques, including disposal of sealed bagged weeds to a licenced waste disposal facility. 	Construction	
Maintain the persistence of PCT 849 (Cumberland Plain Woodland)	Landscape planting shall include the use of local provenance species consistent with PCT 849.	Construction	
Ongoing management of retained vegetation and landscape	The approach for ongoing management of the landscaped areas and vegetation will be implemented into the Nepean Hospital's landscape management plan (or equivalent).	Post construction	HI / NBMLHD
Tree removal / protection			
Tree Protection during works	Any hard landscape features underneath trees to be retained (e.g. landscape, public art, wayfinding, etc. features that may require below grade concrete footings) shall require non-destructive methods to determine the extent of roots present. Construction drawings shall detail that non-destructive root mapping is required where works occur within a TPZ area of any tree to be retained.	Detailed finalisation and prior to commencement of construction	Contractor

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	<p>Trees to be retained shall be fenced for the demolition and construction period. The entire TPZ area within the fenced area shall be mulched with one hundred (100) millimetres of leaf and woodchip mulch for the duration of the works. For Trees 220, 221 and 223 a temporary irrigation system shall be installed for the duration of the works ensuring the TPZ area is watered twice per week for two (2) hours.</p> <p>The location of any new underground services and infrastructure may potentially impact on trees to be retained and their root systems. Strip trenching through TPZ areas can sever roots, thus destabilising trees. All subcontractors that require to undertake trenching shall be supplied with TPZ distances so that major incursions of greater than 10% is avoided. Services / infrastructure may include but is not be limited to: stormwater, gas, water and electricity, etc.</p> <p>Trees to be protected: All protection fencing shall be installed as specified in Section 5.2 and Appendix 5 (Tree Protection – Implementation of Tree Protection Zone) of the Moore Trees Report. Indicative locations of the fencing are shown in the Tree Protection Plan (Appendix 1) of the Moore Trees Report</p> <p>The following activities shall be avoided within the Tree Protection Zone and Structural Root Zone of Trees to be retained;</p> <ul style="list-style-type: none"> • Erecting site sheds or portable toilets. • Trenching, ripping or cultivation of soil (with the exception of approved foundations and underground services). • Soil level changes or fill material (pier and beam or suspended slab construction are acceptable). • Storage of building materials. • Disposal of waste materials, solid or liquid. <p>Tree Damage: If any retained trees are damaged a qualified Arborist shall be contacted as soon as possible. The Arborist will recommend remedial action so as to reduce any long term adverse effect on the tree's health.</p> <p>Signage: Signage shall be attached to the tree protection fencing.</p> <p>Arborist Certification: A Qualified Consulting Arborist with AQF level 5 qualifications that has current membership with either Arboriculture Australia (AA) or Institute of Australian Consulting Arboriculturists (IACA) shall be engaged.</p>	<p>Prior to commencement of and during construction</p>	
Aboriginal heritage / heritage			
<p>Interpretation</p>	<p>An interpretation strategy and plan shall be developed and implemented that details the Aboriginal history of the site and the Penrith area. Interpretation shall include artworks, landscaping and digital displays.</p>	<p>Design Finalisation and Construction</p>	<p>Contractor</p>

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	<p>Interpretation works shall be further developed upon work already commenced in:</p> <ul style="list-style-type: none"> The Landscape Design Report by Arcadia. The Arts & Culture Strategy which includes and Indigenous Walk and Multi-Purpose Room. The Indigenous Walk shall acknowledge Aboriginal connection to Country including the rivers and valleys of the Nepean and Hawkesbury Rivers. 		
Impacts upon undiscovered Aboriginal archaeological artefacts or Aboriginal archaeological potential	Monitoring of excavations shall be undertaken by the relevant interested Registered Aboriginal Parties.	Construction	Contractor
	An unexpected finds protocol (with appropriate induction) will be in place during works to identify and protect any artefacts that may be discovered.		
	If any previously undetected Aboriginal objects are uncovered during the proposed redevelopment, all works must cease in the vicinity of that object and further advice sought from an Aboriginal archaeologist.		
	Unexpected finds or objects may include Aboriginal artefacts made from stone, glass or other post contact material such as electricity conductors, shells, burials, hearths, etc.		
	An induction shall be provided by an archaeologist to all employees, contractors or sub-contractors engaged on the project, detailing their responsibilities under the National Parks & Wildlife Act 1974 in respect of Aboriginal archaeology and heritage and should include advice: <ul style="list-style-type: none"> That it is an offence to harm an Aboriginal object without a permit. How to identify an Aboriginal object. 		
Stormwater management - sediment and erosion control			
Managing water quality	Sediment and erosion control measures shall be employed throughout the works.	Construction	Contractor
Traffic and parking			
Construction traffic management	<p>A Construction Traffic Management Plan (CTMP) shall be prepared to establish that the project can be constructed while maintaining safe access and use of the road network.</p> <p>The CTMP shall be continually reviewed and amended if required, due to changes in design, or additional requirements of DPIE, Penrith City Council, TfNSW or any other authority requirements.</p>	<p>Prior to the commencement of works</p> <p>Construction</p>	Contractor
Amenity - air quality (dust / odours)			
Air quality	A Construction Management Plan and Environmental Management Plan shall be prepared to minimise and mitigate the impacts of construction with respect to dust, odour and any other air quality related matters. Air monitors are to be	Prior to during construction	Contractor

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	provided and monitored during any demolition, bulk earthworks and other construction activities that may likely generate potential air quality issues / disturbance.		
Amenity – noise and vibration			
Managing construction noise and vibration	<p>A Construction Noise and Vibration Management Plan (CNVMP) shall be prepared to ensure that all feasible and reasonable treatments and management conditions are employed to minimise noise and vibration impacts from the construction works.</p> <p>The CNVMP shall include such matters as:</p> <ul style="list-style-type: none"> • Stakeholder and community consultation • Site hoarding • Temporary noise barriers • Scheduling of works • Plant and equipment choice and operation • Work practices 	Construction	Contractor
Aviation			
Protection of airspace for hospital helicopter operations	<p>Cranes associated with the Stage 2 Redevelopment shall not encroach into the Stage 1 Tower Helicopter Landing airspace. The Stage 2 crane arc limit is illustrated in Figure 2 and Figure 6 of the AviPro Report. Approval from the Principal must be sought on the location of all tower cranes.</p> <p>Any Stage 2 crane is required to be appropriately lit.</p> <p>The requirements of the National Airports Safeguarding Framework Guideline H – Protecting Strategically Important Helicopter Landing Sites are applicable in this regard.</p>	Construction	Contractor
Waste generation			
Management of construction waste	<p>To manage waste streams, quantities, and recycling and reuse during the demolition and construction stages of the works, a Waste Management Plan (WMP) shall be prepared and retained on-site during the demolition, excavation and construction phases of the development.</p> <p>Responsibility for the WMP, waste documentation and processes during the excavation and construction phases will be with the Principal Contractor, including managing the following:</p> <ul style="list-style-type: none"> • Maintaining a logbook that records waste management and collection, with entries including: <ul style="list-style-type: none"> - Time and date of waste collections 	Construction	Contractor

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	<ul style="list-style-type: none"> - Description of waste type and quantity - Details of the waste/processing facility that will receive the waste - Vehicle registration and company name of collection contractor. <p>Waste management documentation, the logbook and associated docket and receipts must be made available for inspection by the Principal at any time during the works.</p>		
Operation			
Stormwater management – water quantity			
Managing water quantity	The stormwater management system proposed for the works, including on-site detention, rainwater tank, WSUD measures, and pits and pipes connecting to Council's stormwater system shall be provided.	Construction and operation	Contractor
Stormwater management – water quality			
Managing water quality	The water quality strategy proposed for the works, including water quality treatment measures such as rainwater tank, OceanGuard (or equivalent) pit baskets and stormfilter cartridges, stormfilter cartridge chambers, shall be provided.	Construction and operation	Contractor
Amenity - lighting			
Lighting impacts outside of the hospital	<p>All external lighting local to the Stage 2 Redevelopment will be designed in accordance with both AS/NZS 1158.3.1 Lighting for roads and public spaces series and AS 4282 Control of Obtrusive Lighting.</p> <p>Careful consideration will be given to not only neighbouring sites, but also existing buildings and infrastructure internal to the hospital campus.</p>	<p>Design Development</p> <p>Design Finalisation and Construction</p>	<p>Health Infrastructure</p> <p>Contractor</p>
Amenity – noise			
Management of operational noise impacts	A detailed review of mechanical plant shall be undertaken as part of the detailed design and construction phases to ensure that cumulative noise emissions comply with the project-noise trigger levels (PNTLs) provided in Table 4.8 and Table 4.9 of the Indigeco/EMM report.	<p>Design Development</p> <p>Design Finalisation and Construction</p>	<p>Health Infrastructure</p> <p>Contractor</p>
Amenity - wind			
Wind impacts upon the pedestrian environment of the development	<p>To mitigate or manage the wind environment at the development the following treatments are recommended:</p> <ul style="list-style-type: none"> • Inclusion of densely foliating evergreen trees, capable of growing to 3m high and wide, at the north-eastern corner of the Stage 2 redevelopment along Level 00. 	<p>Design Development</p> <p>Design Finalisation and Construction</p>	<p>Health Infrastructure</p> <p>Contractor</p>

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	<ul style="list-style-type: none"> Inclusion of densely foliating evergreen shrubs/hedge planting, capable of growing to 2m high, on the north-eastern terrace along Level 01. 		
Traffic and parking			
Green Travel Plan	<p>A Green Travel Plan (GTP) shall be prepared by a suitably qualified traffic consultant in consultation with (Sydney Coordination Office) Transport for NSW and shall promote the use of active and sustainable transport modes.</p> <p>The plan shall include:</p> <ul style="list-style-type: none"> Objectives and modes share targets Measures to encourage staff to park in dedicated staff car parks Facilities and measures to promote public transport usage, car share schemes and employee incentives Measures to promote and support the implementation of the plan, including financial and human resource requirements, roles and responsibilities for relevant employees involved in the implementation of the GTP Monitoring regime 	Prior to commencement of operation and ongoing	HI / NBMLHD
ESD measures / climate change			
Providing for and improving the building's efficiency and ESD credentials	The development shall apply the HI NSW Design Guide Note (DGN) No. 058 Ecological Sustainable Design guide (DGN 058) and achieve the equivalent of a 5-star Green Star Design & As Built v1.3 rating and an improvement in performance of at least 10% over NCC 2019 Section J DTS requirements.	Design Development Design Finalisation and Construction Operation	Health Infrastructure Contractor NBMLHD
Hazardous goods (SEPP 33)			
Hazardous / Dangerous Goods handling	<p>Ensure all hazardous chemical storage facilities onsite comply with the relevant Australian Standards.</p> <p>Undertake a Hazardous Area Classification (HAC) for the hospital precinct where flammable gases (Class 2.1) or flammable liquids (Class 3) are stored.</p> <p>Prepare the documentation required for the hospital precinct per Part 7.1 of the Work Health and Safety Regulation 2017.</p>	Design Finalisation and Construction Operation	Contractor (Stage 2 Project) NBMLHD (Campus wide)