



16-24 LORD STREET & 21-27 ROSEVILLE AVENUE, ROSEVILLE

APPENDIX C – 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 DPIE's hierarchy of approaches for managing impacts identified in the *Draft Environmental Impact Assessment Guidance Series* released by DPE in June 2017, 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
Connecting with Country	Development of a proposal that does not respect and care for Country	C & O	C	3	Medium	- Consider carrying out additional consultation at later stages of the project, for example: consultation specific to Aboriginal plantings landscaping, interpretation and public art strategies for the site. - The ICIP guidelines outlined in section 2.8 should be followed in future consultation – particularly in development of an Aboriginal Heritage Interpretation and Art Strategy. The preparation of an Aboriginal Heritage Interpretation and Art Strategy would assist in identifying and conveying key cultural relationships and historic narratives. - Establish protocols to maintain communication with cultural stakeholders. - Incorporate the word “Gamaragal” into signage and wayfinding. - Where possible use Gamaragal dialect (Sydney Language) and/or Dharug Language in wayfinding and interpretive signage - Consult with Aboriginal knowledge holders when conducting and developing environmental management recommendations to educate wider community, to support the maintenance of this	Ma	Low

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						knowledge, and improve the health of ecosystems. ▪ Consider the development of an Aboriginal Heritage Interpretation and Art Strategy. ▪ Provide training and employment opportunities for Aboriginal community members and businesses in various stages of the project's development. ▪ Commission a Welcome to Country ceremony for important milestone events, breaking ground, official opening etc., noting that a Welcome to Country needs to be done by a formal Aboriginal representative (eg AHO, Metro LALC). ▪ Invite members of the local Aboriginal community to events as guests. ▪ Consider how the development might interact with local celebrations of Aboriginal culture, festivals, Sorry Day, NAIDOC. ▪ Ensure the design concept includes a space where community can gather/have access and feel welcome, culturally safe while doing so. ▪ Consider inclusion of areas within the development where Aboriginal community members can interpret their own history and relationships to Country from their own		

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						perspectives (heritage, history, environment, art) ▪ Commit to undertaking post-occupancy evaluations, build on successes and create action plans for areas identified as needing improvement. ▪ Embed Aboriginal engagement as an important element in the development, including its future life. ▪ Consider inclusion of areas within the development where Aboriginal community members can interpret their own history and relationships to Country from their own perspectives (heritage, history, environment, art) ▪ Consider cultural awareness projects which can be implemented, for potential residents, neighbours, and wider community. For the lower north shore there is potential to connect to the educational offerings of the Aboriginal Heritage Office (AHO).		
Wind Environment	Impacts of the development on the surrounding wind environment	O	B	3	Medium	▪ Building entries – Maintain the proposed airlock system and setback at the building entrance. – The proposed trees located near the building entries will further alleviate local wind impacts ▪ Surrounding Pedestrian Footpaths	Ma	Low

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						- Retain the existing street trees on the Roseville Avenue, Lord Street and Martin Lane frontages Communal Open Space on ground level - Retain the proposed trees and landscaping. All trees and landscaping are to be evergreen, densely foliated and at least 3 metres in height to ensure their effectiveness year-round. - Any seating areas are to be located under the proposed trees with generous canopies. Elevated corner balconies - Ensure the balustrade height achieves at least 1.5m.		
Traffic, Transport & Parking	Impacts of the construction of the development on the traffic and pedestrians	C	B	3	Medium	The CPTMP is to be implemented as part of the construction works associated with the proposed development. Mitigation and management measures specified as part of the CPTMP relate to: - Work hours; - Worker induction; - Site access, loading, and works zones; - Construction worker parking; - Heavy vehicle access routes; and - Pedestrian and cyclist access.	Ma	Low
Traffic, Transport & Parking	Impacts of the operation of the development with regard to sustainability and climate change	O	C	3	Medium	The Preliminary GTP is to outline the overarching requirements for the GTP. As a 'living' document, the GTP is to be updated regularly as part of an ongoing review to ensure it remains relevant and	Ma	Low

SEARS	Potential Impact	Stage of Project	Likelihood	Consequence	Risk Level	Approach	Mitigation Measure (Pe/Pr/Ma)	Residual Impact
						reflective of current conditions. The primary objectives of the GTP are to: ▪ Reduce the environmental footprint of the site; ▪ Set future travel mode share targets; ▪ Improve access, amenity, convenience, and safety of sustainable transport modes to/from the site; ▪ Promote the use of 'active transport' modes such as walking and cycling, particularly for short-medium distance journeys; ▪ Reduce reliance on the use of private vehicles for all journeys; and ▪ Encourage a healthier, happier, and more active and public transport use culture. The GTP sets indicative targets to encourage modal shift away from private vehicles to utilising public and active transport networks as set out below. The GTP sets out measures and actions strategies to achieve these targets including promoting active travel, car pooling and public transport, as well as providing information on sustainable travel choices to residents. So as to record the overall success, as well as the effectiveness of the individual measures, monitoring and review of the GTP should be conducted at regular intervals.		
Noise and Vibration	Impacts of the construction of the development on surrounding properties	C	A	3	Medium	▪ Preparation of a Construction Environmental Management Plan ▪ Noise and vibration monitoring, reporting and response procedures ▪ Selection of equipment and process	Ma	Low

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						▪ Selection of alternate appliance or process ▪ Location of static plant ▪ Use of screens or enclosures and erection of hoarding (typically only feasible for static plant) ▪ Acoustic barriers ▪ Silencing devices ▪ Treatment of specific equipment ▪ Material handling/vehicles ▪ Establishment of site practices ▪ Scheduling of noisy activities and provision of respite periods ▪ Notification ▪ If construction noise levels are predicted to exceed the HNML 75dB(A) during any stages of the project, the following is to be undertaken: – During preparation of the construction program (CC stage), acoustic review of proposed construction activities and plant/methods should be undertaken to identify work items likely to exceed Noise Management Levels. – For those activities likely to generate high noise levels, the analysis should identify where on the site are the areas likely to result in high noise levels. This will then assist in determining the likely time period for which high noise levels will occur. – Identify feasible acoustic controls or management techniques (use of screens,		

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						scheduling of noisy works, notification of adjoining land users, respite periods) when excessive levels may occur. – For activities where acoustic controls and management techniques still cannot guarantee compliant noise levels, implement a notification process whereby nearby development is made aware of the time and duration of noise intensive construction processes. ▪ Where required, vibration monitors may be installed at critical locations to determine any impact. Ongoing review and assessment of vibration impact will be conducted throughout the construction process to determine appropriate vibration levels. The specific location and quantity of vibration monitors to monitor residential houses are to be determined in consultation with the builder and structural engineer.		
Noise and Vibration	Impact of the surrounding road and rail network on the amenity of the proposed dwellings	O	B	3	Medium	▪ Glazed Windows and Doors Acoustically rated external windows and doors are required. Aluminium framed/sliding glass doors and windows will be satisfactory provided they meet the criteria specified at Table 10 of the NVIA. All external windows and doors listed are required to be fitted with Q-lon type (or equal) acoustic seals. In addition, the Rw rating of the glazing fitted into open-able frames and fixed into the building	Pr	Very low

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						opening should not be lower than the values listed in Table 11 of the NVIA. - External walls External walls should be constructed from concrete/masonry elements will not require any acoustic upgrading to achieve the acoustic requirements specified in the NVIA. - Non-glazed Entry Doors Doors are required to be minimum 44mm thick solid core timber (minimum 32 kg/m² surface density), fitted with full perimeter acoustic seals equal to Raven RP10 to the top and sides and Raven RP38 to the underside of a hinged door. - Penetrations in the External Envelope It is required to acoustically treat all penetrations in the external envelope, including any supplementary ventilation system, to prevent that the acoustic performance of the building envelope from being reduced. - Mechanical Plant Noise emissions from all mechanical services to the closest residential receivers should comply with the requirements of section 5.1 of the NVIA. - Mechanical Treatment Detailed acoustic review should be undertaken at Construction Certificate stage to determine acoustic treatments to control noise emissions to required levels.		

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Water Management	Impacts of the development on stormwater water quantity or quality	O	C	3	Medium	To result in acceptable stormwater impacts from the proposed development, OSD tank (minimum size of 178m³) to attenuate peak flow discharging from site to a PSD of 195 l/sec. The following stormwater quality management measures are proposed: ▪ 10kL rainwater reuse tank ▪ OceanProtect's Ocean Guards litter baskets at every grated inlet pit ▪ 16 x 690mm stormfilter cartridges ▪ Vegetated swale.	Pr	Very low
Ground & Water Conditions	Impacts of the construction of the development on surrounding ground and groundwater conditions	C	C	3		<u>Site Preparation</u> Dilapidation (building condition) reports should be undertaken on surrounding properties prior to commencing work on the site to document any existing defects so that any claims for damage due to construction related activities can be accurately assessed. As a minimum this should include the adjacent residences southwest of the site (14 Lord Street and 19 Roseville Avenue), the scout hall north of the site (29 Roseville Avenue), and all other road pavements and infrastructure surrounding the site. <u>Excavation</u> Vertical excavations in fill, natural soils and weathered rock will not be self-supporting and will need to be temporarily and permanently supported by shoring walls. Temporary batters of 1.5(H):1(V) may be used for excavations to a maximum depth of 3m in the fill and residual soil profile. Higher batters may need to incorporate an	Ma	Low

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						intermediate bench and additional stability analysis will be required to determine the safe batter slopes. All surcharge loads must be kept behind a distance from the crest equal to the height of the batter. Permanent batters for excavations and embankments should be no steeper than 2.5(H):1(V) and flatter, where vegetation maintenance is required. Erosion protection should be provided for all permanent batters. <u>Ground movement and stress relief</u> it is recommended that appropriate allowance be made for movements in the order of 0.05% to 0.2% of the excavation height in construction and planning. Survey points and inclinometers should be used to monitor the side wall movement of the excavation. <u>Groundwater</u> During construction it is anticipated that seepage into the excavation could be controlled by perimeter drains connected to a "sump-and-pump" system. This SSDA is for integrated development, with approval from the Department of Climate Change Energy Environment and Water (DCCEEW) sought for the construction of the proposed drained basement. The drained basement will require permanent subfloor drainage to direct seepage to the stormwater drainage system. Seepage will likely contain relatively high levels of soluble iron that will form a precipitate in the form of a		

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						gelatinous 'sludge' when exposed to oxygen. This 'sludge' has the potential to block-up subsoil (gravel) drains and 'seize-up' pumps. Therefore, detailing of subfloor drains, sumps and pumps should incorporate provision for regular maintenance such as flushing and 'rodding' of drains and / or "baffle" pits. <u>Geotechnical construction monitoring</u> Geotechnical monitoring will be required through the construction phase of the project to ensure design requirements are met and impacts to adjacent infrastructure is controlled. It is recommended that a Geotechnical and Hydrogeological Monitoring Plan (GHMP) to be prepared when the detailed design has been progressed to at least 75%. The recommended final GHMP would include as a minimum, the following elements: ▪ Roles and responsibilities; ▪ Monitoring systems, procedures and trigger levels; ▪ Hydrogeological monitoring; ▪ Vibration monitoring; and ▪ Certification requirements. <u>Basement Construction</u> It is considered that there are some contamination risks that will need to be managed during dewatering, therefore, the following measures are proposed to manage these risks: ▪ Additional groundwater quality testing prior to undertaking dewatering to further characterise groundwater contamination across the site;		

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						- Design the dewatering treatment system with consideration of the potential contaminants of concern; - Undertaking initial testing (pilot trial) of the treatment system prior to discharge; and - Continual testing of groundwater during dewatering. <u>Dewatering and Disposal</u> Below are the key principles for the proposed management strategy based on the anticipated methodology for dewatering and disposal. Please refer to Section 9 of the HMP for further details. - Water quality control - Treatment system pilot trial - Monitoring and reporting - Personnel and relevant responsibilities - Contingency plan. <u>Electrolysis</u> The following conservative protective measures, where possible and/or practical, are proposed to mitigate against long-term stray current corrosion at on-ground and in-ground metallic structures: - The installation of heavy plastic membrane (e.g. Fortecon) under (or behind) all reinforced concrete slabs, permanent retaining walls, permanent anchors, piers/piles, and metallic posts/bollards to electrically isolate from soil and stray currents. Note, this may not always be possible/practical at piers/piles or		

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						when friction is relied upon for structural purposes. ▪ Ensure the high strength (minimum 32 MPa), high cover (minimum 50 mm) concrete is used to effectively prevent/limit soil moisture penetrating through to the steel/metal. ▪ The use of plastic, rather than metallic, in-ground pipework and tanks. In the event buried metallic pipework and/or cables are installed within the site, installation within sealed non-metallic conduit is recommended. Where this is not possible (for example at metal water main feeds), insulating flanges/fittings/unions at the property boundary/meter can be used to electrically isolate the property piping. A minimum of two electrolysis test points such as an Erico Earthbridge DB12CS701, in conjunction with an Ag/AgCl permanent reference electrode installed close to the reinforcing steel, shall be provided at every at/below ground level. This is to assist with potential (stray current) monitoring.		
Trees & Landscaping	Impacts from demolition and construction of the development on trees within the site and on adjoining land	C	C	3	Medium	▪ Following the design development and prior to any construction works taking place on site, a dedicated Tree Protection and Management Plan is to be prepared by a suitably qualified AQF Level 5 Arborist. The purpose of this document is to provide a suitable framework for tree protection to ensure all trees nominated for retention are not	Pe	Low

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						adversely impacted by the proposed works. ▪ Engagement of a Project Arborist with relevant experience in tree protection on construction sites to be engaged prior to the commencement of any works on site. The Project Arborist will monitor and report regularly to the PCA and the Applicant on the condition and protection of the retained trees during the works. The Project Arborist will supervise and monitor any excavation, machine trenching or compacted fill placement within the TPZ of retained trees throughout the construction phase of the project. ▪ Root sensitive Construction of pathways and decking – The decking and pathways within the TPZ of trees 39, 52, 67, 85 & 93 are to be constructed utilising lightweight, raised, low profile decking or gate structure (FRP). The structure is to be constructed entirely above the existing ground levels with minimal excavation for supports/piers to mitigate potential impacts within the root zone. The final design, levels and construction methodology of the decking and pathways are to be reviewed and approved by the Project Arborist prior to construction. – Works associated with the footings/piers of the elevated		

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						pathways and decking within the TPZ of Trees 39, 52, 67, 85 & 93 must be undertaken under the supervision of the Project Arborist. – Initial test exploratory excavation must be undertaken for footing/pier locations to a depth of 600mm to ensure no conflict with existing significant tree roots. Exploratory test excavation is to be carried out by hand using non-motorised hand tools or pneumatic excavation methods (or similar approved device) to protect tree roots. – Should test excavation reveal conflict between the proposed footing/piers locations and existing significant tree roots, footings/piers are to be re-positioned as directed by the Project Arborist to avoid any conflict. ▪ Root sensitive construction of Flood Levee – Construction of the Flood Levee within the TPZ of Trees 52 & 67 is to be entirely above the existing grade so that no excavation takes place. If excavation is deemed necessary, it must not exceed 50mm and be undertaken in a root sensitive manner to ensure roots are maintained and undamaged. – Excavation should be undertaken using non-		

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						motorised hand tools under supervision of the Project Arborist. Should significant roots be identified (>25mmØ) during construction, works are to cease, and direction sought from the Project Arborist with regards to root pruning, modification of construction methodology or design alteration. ▪ Root sensitive construction of 4m wide swale – The location of the 4m wide and 0.15m deep Swale is to be re-routed to avoid the TPZ of Trees 39, 52 & 93. If construction of the swale within the TPZ of is deemed necessary, excavation must not exceed 50mm and be undertaken in a root sensitive manner to ensure roots are maintained and undamaged. – Excavation should be undertaken using non-motorised hand tools under supervision of the Project Arborist. Should significant roots be identified (>25mmØ) during construction, works are to cease, and direction sought from the Project Arborist with regards to modification of construction methodology or design alteration. ▪ Root sensitive installation of stormwater services – The installation of underground stormwater pipes, pits, drains		

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						etc. shall be located outside of the TPZ of retained trees. Where this is not possible, installation of all underground services within the TPZ of retained trees (Trees 49, 52, 67, 93 & 110) shall be undertaken in a root-sensitive manner under supervision of the Project Arborist. Excavation for installation shall be performed using either Air Spade or hand excavation methods with the services installed around/below roots {>25mmØ, or as determined by the Project Arborist). – Alternatively, boring methods such as Horizontal Directional Drilling may be used for underground service installation where the installation depth is greater than 1m below existing grade. Excavations for starting and receiving pits for boring equipment shall be located outside of the TPZ or located to avoid roots {>25mmØ, or as determined by the Project Arborist). ▪ Root mapping investigations – Extensive paved surfaces and retaining walls are to be located within the TPZ of Trees 5, 20, 49, 85, 86 & 102 in addition to a proposed driveway within the TPZ of Trees 20 & 49. In addition, stormwater infrastructure is proposed		

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						within the TPZ of Trees 52 & 67. Root Mapping Investigations must be undertaken to identify the location and presence of roots that have the potential to be impacted from the proposed works and determine if any design alterations or root sensitive construction methodology will be required to ensure these trees retention and protection – Detailed root investigations and mapping using minimally destructive techniques (hand digging or Air Spade) must be carried out along the exact alignment of the proposed paved surfaces, retaining walls and driveway or stormwater infrastructure within the TPZ of Trees 5, 20, 49, 52, 67, 85, 86 & 102. If root mapping identifies any significant roots, the design may have to be adjusted, or root sensitive construction methodology employed to prevent any potential damage. – Documentary evidence of the findings must be presented in Report format including the following information: • A plan showing the location of all excavation lines including points of reference and orientation details; • A section plan of the excavation showing all		

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						material found within the excavated area; • Photographs (including points of reference and orientation details); • A schedule of findings for each individual excavation line including details of total linear distance of the excavated line, number of roots found, linear distance along the excavation that roots are located, depth at which roots were located, condition of the roots & diameter of the roots – Suitable evidence must be provided demonstrating the proposal will not impact the long-term health and viability of Trees 5, 20, 49, 52, 67, 85, 86 & 102. Should it be determined by the Project Arborist that the extent of impact is likely to be unsustainable or will result in the decline of Trees 5, 20, 49, 52, 67, 85, 86 & 102, design modifications and relevant approvals must be sought which ensure impacts are reduced to a sustainable level. ▪ Tree 88 is to be transplanted into a more suitable position within the subject site in accordance with the requirements of the AIA. Tree protection measures must be adhered to as specified in Section 4 of AS4970-2009 and consultation shall be undertaken with the		

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						- Landscape Architect regarding suitable transplant locations - All tree removal work is to be carried out by an experienced Arborist with minimum AQF Level 3 qualifications in accordance with <i>AS4373-2007 - Pruning of Amenity Trees</i>, Safe Work Australia Guide for Managing Risks of Tree Trimming and Removal Work (2016) and other applicable legislation.		
Flood Risk	Impacts of the development on levels of flood risk in the surrounding area	O	C	3	Medium	Construction of a flood wall barrier as detailed on civil drawings and described in the FRA to meet flood immunity to various storm events up to and including 1% AEP.	Pr	Low
Flood Risk	Impacts of flood risk on the future development	O	C	4	Low	Prior to occupation of the development, a Flood Emergency Management Plan is to be prepared.	Ma	Very low
European Heritage	Impact of the proposed development on the surrounding HCA and locally listed heritage item	O	C	2	Medium	- The finalisation of the façade treatment, acknowledging that the facade design should not be visually dominant in the streetscape but should focus on visually breaking the development visual scale into smaller architectural facades or buildings and elements. - The final architectural treatment at roof level should identify opportunities to create some minor variation in heights across the development to achieve the objective outlined in the point above and to step away from the heritage item and surrounding HCAs.	Pr	Low

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						▪ The detailed resolution of the interface between the adjacent locally listed heritage item Roseville Scout Group Hall (#115) through materials selection and façade articulation. ▪ The detailed design of the landscaping including selection of species and size/maturity. There may also be an opportunity to interpret the original subdivision pattern in the landscaping.		
Contamination	Management of the potential for contamination during construction	C	D	3	Low	▪ Conduct a hazardous building materials survey prior to any demolition / renovation works. ▪ A site inspection and walkover is to be conducted by a qualified environmental consultant post demolition to assesses soils for potential contamination from demolition works. ▪ Complete a post-demolition data gap assessment of soils within the existing building footprints and across the central areas of the site, including a detailed asbestos assessment. The data gap assessment is to include test pits and asbestos sieving where signs of asbestos or significant quantities of building rubble is observed, as well as additional assessment in areas where soils are likely to be retained in the upper 2 m from the finished surface level to further assess ecological exceedances of contaminants. Should further asbestos contamination be found, a	Ma	Very Low

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						remediation action plan may be required. - Conduct a further groundwater assessment prior to dewatering and during construction to assess the shallow water table observed in BH02 and BH04, determine dewatering treatment requirements and assess the DDE detection at BH05. Based on the findings of this assessment, treatment of groundwater should be conducted during the dewatering process, which should be possible through standard treatment processes such as pH adjustment and flocculation. Specific criteria should be confirmed by the relevant authority (e.g. Sydney Water or Council) and discussed with the dewatering contractor. - Prepare an unexpected finds protocol for the construction phase of the development.		
ESD	Impacts of the proposed development on the sustainability targets and principles	C&O	D	3	Low	- A site-specific Environmental Management plan is to be developed that covers the scope of construction activities through to completion. - The building shall install smart meters to track energy and water consumption in real-time. - The building shall provide bins for the separation of waste streams in designated waste storage areas. The design of these areas shall be approved by a waste specialist or contractor.	Pe	Low

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						- As a future opportunity, the paints, sealants and carpets used internally should have low levels of Total Volatile Organic Compounds (TVOC). - All engineered wood products shall have low levels of TVOC. - The development shall consider the inclusion of all electric appliances and hot water systems, as specified in the BASIX certificate. Any heating, ventilation, air conditioning, refrigeration systems, and cold/freezer rooms will exclude the use of refrigerants like chlorofluorocarbons (CFCs) or hydrochlorofluorocarbons (HCFCs) with high ozone depletion potential. - The specifications outlined in the BASIX certificate in relation to solar panels, a minimum 10kL rainwater tank, energy-efficient appliances and LED lighting, high insulation in walls, exposed ceilings, suspended floors and efficient double-glazed shall be considered. - Options will be explored to use materials with low embodied carbon emissions, including products made from recycled or reused content, sustainably sourced timber and steel, items with Environmental Product Declarations (EPDs), low-carbon concrete alternatives like fly ash or slag cement, and locally sourced materials to minimize transportation emissions.		

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Waste management	Impacts of the proposed development on construction waste generation rates	C	C	3	Medium	Construction - All waste generated during the construction and demolition stages of the proposed development will be classified in accordance with NSW EPA Waste Classification Guidelines 2014. Assessments should be routinely conducted of waste loads stored in skips or appropriate containers predisposal and off-site transfer to waste facilities, to ensure all materials can be accepted for disposal and recovery. All waste classification assessments must follow the six-step procedure as outlined within the EPA waste classification guidelines stipulated above, with all waste classification data to be collected and recorded appropriately across the life of the development. - It is the responsibility of the appropriate Site Supervisor and relevant managing contractor that all waste disposal, load transfers and required assessments is adequately tracked and stored in a Waste Data File. Any associated receipt/invoices, waste classification documents and site validation certificates should be logged within this file accordingly.	Pr	Low
Waste management	Impacts of the proposed development on operational waste generation	O	B	3	Medium	Operational Provide a copy of the endorsed Waste Management Plan to the building operator and residents. During site inductions for the construction and demolition phase,	Pr	Low

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						all contractors must be made aware of the waste management obligations, practices and legislative controls provided in this plan.		
Social Impact	Impacts related to Connecting with Country.	C	C	4	Low	Ensure ongoing landscape and development design clearly demonstrates a response to the CwCR that is commensurate with reasonable expectations.	Pe	High positive
Social Impact	Impacts related to construction traffic	C	C	3	Medium	Prepare a Construction Pedestrian Traffic Management Plan (CPTMP).	Ma	Low
Social Impact	Impacts related to construction	C	B	2	High	Provide ongoing communication to surrounding residents prior to and throughout the construction period.	Ma	Low
Social Impact	Impacts related to ongoing community consultation throughout the construction process	C, O	C	4	Low	Conduct community engagement activities aimed at informing surrounding residents on progress of the development. Host open days at Occupation Certificate stage and invite surrounding residents.	Ma	Low
Social Impact	Impacts related to operational traffic	O	C	4	Low	Implement measures identified in the Green Travel Plan	Ma	Low
Aboriginal Heritage	Impacts related to unexpected finds	C	E	2	Very Low	If Aboriginal objects are discovered during the proposed works, works must stop immediately and an assessment must be undertaken in accordance with Part 6 of the National Parks and Wildlife Act 1974. It is recommended that a stop-work procedure be developed to allow proper assessment and management of any unexpected Aboriginal objects. A sufficiently	Ma	Low

SEARS	Potential Impact	Stage of Project	Likelihood	Consequence	Risk Level	Approach	Mitigation Measure (Pe/Pr/Ma)	Residual Impact
						experienced and qualified archaeologist should be engaged immediately to address the unexpected find and advise of further actions.		
Archaeological Heritage	Impacts of the demolition and construction of the proposed development on any heritage items below ground level	C	D	3	Low	▪ Unexpected Finds Procedure – As the study area has been assessed as having Nil-Low archaeological potential, it is recommended that potential archaeological resources be managed through an Unexpected Finds Procedure that is developed for the proposal. ▪ Heritage Induction – All staff involved in the proposed works, including design professionals and tradespeople, must receive a heritage induction prior to the commencement of works. The heritage induction should cover the historical values of the site and the potential for the project to encounter significant archaeological resources. – The induction should make contractors aware of the recommendations and mitigation methods included in this report, including the procedure to follow in the event that an unexpected archaeological find is encountered. Clear lines of communication must be established for the reporting of any such finds and for	Pr	Low

SEARS	Potential Impact	Stage of Project	Likelihood	Consequence	Risk Level	Approach	Mitigation Measure (Pe/Pr/Ma)	Residual Impact
						procedures to be rapidly implemented.	▪ General – Any additions or design modifications to the proposal, outside the scope of this assessment, would require additional heritage assessment to ensure consistency with this assessment – A copy of this report should be provided to the Ku-ring-gai Council and Heritage NSW to inform them of the proposal and the potential impacts to the study area.	