

Appendix C–Environmental Risk Assessment and Mitigation Measures –

The following table provides recommendation for the updated mitigation measures in response to potential impacts identified in **Section 8** of the EIRS and the Response to submission Letter.

SEARS	Potential Impact	Stage of Project	Mitigation Measure
Traffic and Transport	Impacts on road network from construction and operational phase.	Construction / Operation	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. ▪ At construction vehicle access/egress points, priority is to be given to trucks accessing the site over trucks egressing the site so as to have no impact to traffic flow on surrounding roads (unless exceptional circumstances do not permit) ▪ 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; ▪ Construction access from the external road network to mainly occur at signalised intersection;

- 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 WorkCover 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, train 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.
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- The appointed contractor will include the following in all subcontract procurement packages as part of a driver code of conduct:
 - a copy of the approved truck routes as previously detailed in this document.
 - the approved maximum truck size
 - any other entry restrictions, or site access restrictions as agreed to by the authorities.

Visual Impact	Potential impacts of the development on the surrounding area.	Operation	Given the existing urban context, the anticipated future density of Macquarie Park, and the nature of existing private views, the private domain view impacts are low and acceptable, with neighbouring dwellings experiencing a change in visual composition rather than any loss of valued scenic views. In relation to potential cumulative impacts concerning visual impacts, the compatibility for the proposal in the relation to its visual context is assessed throughout the VIA. The proposal is compatible noting it will adjoin a visually significant high-density cluster of existing and future planned developments of similar stature and nature, therefore having a high compatibility rating with the local and emerging character of development within Macquarie Park.
Noise and Vibration	Impacts of the construction of the development on surrounding properties	Construction / Operation	Construction Mitigation measures To mitigate construction noise and vibration impacts, the NVIA recommends the implementation of the following measures:

- Preparation and implementation of a Construction Noise and Vibration Management Plan (CNVMP) prior to the commencement of works
- Noise and vibration monitoring at representative sensitive receivers
- Sequencing of works to minimise the duration of high-noise activities
- Use of acoustic screening, silencers and quieter plant, where feasible
- Consideration of alternatives to tonal reversing or warning alarms
- Implementation of respite periods during highly noisy works
- Ongoing community notification and consultation, including advance notice of high-impact activities

Subject to the implementation of these mitigation measures, construction noise and vibration impacts are not expected to result in any unacceptable amenity impacts to surrounding sensitive receivers.

Noise and Vibration	Impact of the surrounding road and rail network on the amenity of the proposed dwellings	Operation
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Operational Mitigation Measures:

The NVIA recommends the following mitigation measures to manage operational noise and vibration impacts:

- Detailed acoustic design and treatment of mechanical plant, including selection of low-noise equipment, acoustic enclosures, in-duct attenuation and appropriate plant location

- Implementation of the recommended building envelope treatments, including acoustically rated glazing, seals and supplementary ventilation systems where required
- Operational controls for loading, waste collection and servicing activities, including appropriate scheduling and management procedures
- Review and confirmation of operational noise controls at the Construction Certificate stage, supported by a detailed acoustic assessment once plant selections and layouts are finalised

Subject to the implementation of the recommended mitigation measures, operational noise and vibration impacts will comply with the relevant standards and will not unreasonably affect nearby receivers or future occupants.

Geotechnical and Groundwater	Impacts of the proposal on the groundwater	Construction	The geotechnical conditions, groundwater behaviour and proximity to the Sydney Metro tunnels have been comprehensively investigated. The assessments confirm that the proposal can be constructed without adverse impact on the rail infrastructure, groundwater regime or surrounding land, subject to detailed design, monitoring and TfNSW approval during the next design stages
Contamination	Management of the potential for contamination during construction.	Construction / Operation	Key controls include: ▪ Shoring systems designed to limit ground movement and stress relief

		▪ Restrictions on anchors, piles and footings within the rail reserves ▪ Possible tapering of excavation depth toward the north-east ▪ Vibration limits, monitoring and trial excavation to verify plant selection ▪ Detailed review and approval by TfNSW at DA and CC stagesThe proposed excavation will extend well below the groundwater table. Geotechnical assessment confirms that groundwater inflows are expected through rock joints and bedding planes but can be effectively managed by: ▪ Perimeter and subfloor drainage connected to sump-and-pump systems (drained basement option), or ▪ Adoption of a tanked basement designed to resist hydrostatic uplift ▪ Numerical groundwater modelling and monitoring will be required to satisfy Council and TfNSW that dewatering will not adversely affect surrounding land, Shrimptons Creek or the rail tunnels. Groundwater quality testing indicates water is likely suitable for discharge to stormwater subject to approval
ESD	Impacts of the proposed development on the sustainability targets and principles.	These measures collectively demonstrate a holistic and integrated approach to ESD that prioritises passive design, resource efficiency and whole-of-life performance. To achieve these outcomes, the project incorporates a range of ESD measures, including: ▪ ESD principles are incorporated in the design and ongoing operation of the development as outlined in this report.

		Sustainability Standards for Residential Development (BASIX) are incorporated in the design and ongoing operation of the development as detailed in this report and the BASIX Certificate. Sustainability Standards for Non-Residential Development set out in Chapter 3 of State Environmental Planning Policy (Sustainable Buildings) 2022 are incorporated in the design and ongoing operation of the development as detailed in this report
Social Impacts	Potential social impacts as a result of the development	- Delivery of a diverse mix of dwelling sizes, including affordable housing managed through an accredited Community Housing Provider (CHP). - The Proponent intends to continue existing partnerships with an accredited Community Housing Provider (CHP). - Provision of high-quality communal spaces, podium-level amenities and enhanced public domain to support social interaction and community cohesion. - Inclusion of on-site communal and recreational spaces to meet some resident needs and reduce reliance on external facilities. - Upgrade and embellishment of on-site open space and improved connections to adjoining reserves and public domain. - Implementation of a Construction Traffic Management Plan and Green Travel Plan to manage traffic, pedestrian safety and encourage sustainable transport. - Integration of Connecting with Country and Aboriginal co-design principles into architecture, landscape, wayfinding and public spaces.

		▪ Implementation of noise, vibration, dust and air quality mitigation measures in accordance with technical assessments. ▪ Incorporation of CPTED principles, active frontages, lighting, clear sightlines and communal spaces. ▪ Slender tower forms, façade articulation, setbacks and public domain landscaping consistent with the VIA. ▪ Building setbacks, façade articulation, window placement, separation distances and confinement of height to upper levels. ▪ Delivery of a mixed-use development generating employment during construction and ongoing retail and operational activities. ▪ Ongoing community and stakeholder engagement throughout construction and operation. ▪
Flood Risk	Impacts of the development on levels of flood risk in the surrounding area	▪ Incorporation of flood gates as per design to offer additional protect during rare extreme flood events up to the PMF SSP3-7.0 2030. Flood gates are proposed to be installed at the loading dock entrance and the internal lift location. In addition to offering protection to the basement levels, they also offer protection for additional pedestrian flood evacuation routes which form part of the flood emergency response strategy. ▪ Evacuation routes – to support the flood emergency response strategy of evacuation during rare extreme flood events, the architectural design includes provision for pedestrian movement through the building to access levels above the PMF SSP3-7.0 2030

		peak flood level, from which further evacuation from the site is possible
Wind Impact	Impact of the Wind on the proposed development.	Based on these findings from the wind tunnel study, this report concludes that the proposed development is suitable and warrants approval subject to the implementation of the following mitigation measures: ▪ Ground – Full height porous screening along the southern perimeter of the area adjacent the mail room. – 1.2m high impermeable screening along the ramp access to Cottonwood Tower. – An impermeable awning with a minimum depth of 3m wrapping around the eastern corner. – 1.5m high 50% porous screening along the staircase to the Waterloo lobby entrance and within the landscaped area at the eastern corner. – 1.5m high 50% porous screening or planter box with dense vegetation with total height of 1.5m along the proposed northern seating area. ▪ Level 4 – 1.8m high impermeable screening around the western corner balcony of Cottonwood Tower. – 1.5m high impermeable screening around the western pool deck area.

- An impermeable awning with a minimum depth of 2m wrapping around the western corner of
- Waterloo Tower.
 - Retention of all proposed tree and shrub planting throughout the podium rooftop areas as densely foliating evergreen species to provide all year protection.
- Cottonwood and Waterloo Rooftop Terraces
 - 1.8m high impermeable screening to partition up the rooftop areas.

Following the implementation of the above management measures / mitigation measures, the remaining impacts are considered negligible and appropriate.

Water Management

Mitigation measures include:

- Sandbag protection will be installed surrounding all existing stormwater drainage
 - shaker grid and wash down facility will be installed at all exits from the construction site. All vehicles leaving the site will have their wheels washed down and pass over the shaker grid to remove any spoil collected on their wheels and retaining the spoil on site
 - Installation of sediment fences on all downstream boundaries of the site to collect sediment and prevent it discharging onto downstream properties or waterbodies.
 - Regular inspection of the sediment fences to ensure they are functioning correctly and are intact.
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			▪ If sediment build up is present it should be removed to ensure correct functionality of the fences ▪ A Soil and Water Management Plan has prepared as part of the development application documentation
Waste Management	Impacts of the proposed development on construction and operational waste generation rates	Construction / Operation	Operational mitigation Measures: ▪ Waste generation rates will be monitored, and bin capacities will be adjusted based on actual data to meet operational needs ▪ Separate bins for general waste and, recycling will be provided in designated areas and collected as per the agreed schedule with the waste service provider. ▪ Source separation bins for different waste streams, including food waste and recyclables, will be strategically located throughout the school ▪ Bins will be regularly cleaned either onsite using bin washing facilities or by engaging specialist contractors ▪ Waste storage areas will be designed and maintained to ensure ease of access, proper ventilation, and compliance with safety standards. ▪ Design and construction of waste storage areas shall comply with NSW Better Practice Guide (2019), and relevant standards (e.g., AS1668.4-2012 and BCA). Requirements to include proper ventilation, lighting, smooth and durable surfaces and sewer-approved drainage connections. ▪ All designs and requirements included shall comply with the OWMP

Biodiversity

Impacts of the proposal on the existing, surrounding and adjacent habitat

Construction

- Access for future construction is to take place utilising existing cleared/exotic areas of the Subject Land. Temporary fencing should be erected around retained vegetation and suitable habitats. Exclusion zones should be set up at the limit of clearing in accordance with specifications provided in the project Construction Environmental Management Plan (CEMP). Sediment and erosion control is discussed further below.
- A suitably qualified Project Ecologist should be engaged prior to clearing works to undertake a pre-clearing inspection of the Subject Land. The pre-clearing inspection will include:
 - Targeted surveys for any new threatened species (with focus on threatened flora not previously surveyed)
 - Microbat inspections of all human-made structures proposed for demolition
 - Demarcation of fauna habitat
 - Demarcation of Priority Weeds listed under the Biosecurity Act 2015.
- Australian Standard 4970 (2009) Protection of Trees on Development Sites (AS-4970) outlines that a Tree Protection Zone (TPZ) is the principal means of protecting trees on construction sites. It is an area isolated from construction disturbance so that the tree remains viable. Ideally, works should be avoided within the TPZ.
- A Minor Encroachment is less than 10% of the TPZ and is outside the Structural Root Zone (SRZ). A Minor Encroachment is considered

acceptable by AS-4970 when it is compensated for elsewhere and contiguous within the TPZ.

- A Major Encroachment is greater than 10% of the TPZ or inside the SRZ. Major Encroachments generally require root investigations undertaken by non-destructive methods or the use of tree sensitive construction methods.
 - Tree protection fencing is to be installed around all trees proposed for retention within and surrounding the Subject Land.
 - Any woody debris (fallen trees and logs) within the Subject Land is to be relocated to areas of retained native vegetation within the greater Site Boundary.
 - The removal of non-native and native vegetation may reduce some foraging habitat for threatened species potentially utilising the Subject Land. Although it is highly unlikely to affect the persistence of these threatened species in the region, future landscaping should incorporate native plantings suitable for foraging. These species, and all landscaping within the Subject Land should be representative of the locally indigenous ecological communities:
 - PCT 3592: Sydney Coastal Enriched Sandstone Forest
 - PCT 3176: Sydney Enriched Sandstone Moist Forest
 - Hygiene protocols should be implemented to prevent the spread of weeds or pathogens between infected and uninfected areas of the Subject Land and greater Site Boundary.
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- Priority Weeds, as well as all other weeds within the Subject Land should be bagged, removed from site and disposed of at a registered waste facility.
- A site-specific Erosion and Sediment Control Plan is recommended. Construction detailing the measures and controls to be applied to minimise erosion and sediment control risks. These may include: runoff, diversion and drainage points; sediment basins and sumps; scour protection; stabilising disturbed areas as soon as possible, fencing and swales; and staged implementation arrangements.
- The Plan will also include arrangements for managing wet weather events, and working with high surface water levels, including monitoring of potential high-risk events (such as storms) and specific controls and follow-up measures to be applied in the event of wet weather.
- Any temporary structures required for construction, such as temporary facilities and laydown areas, must be located in areas away from native vegetation within cleared/exotic land.
- All fuels, chemicals and other hazardous materials must be stored in accordance with relevant Australian Standards and/or safety data sheets.
- Importing of soils from outside the site should be avoided where possible due to the potential of pathogen and weed introduction.
- Only weed-free material is to be reused during site rehabilitation. Appropriate hygiene measures such as vehicle and equipment cleaning protocols must be implemented to ensure that operations

within the Subject Land do not contribute to the encouragement or spread of feral pest, disease or weed species.

- Careful timing for any revegetation works in the corridor if this is proposed (e.g. late spring)
 - Incorporation of locally indigenous vegetation communities in landscaping and restoration.
 - Street lighting is to be constructed it is recommended that street lighting faces downwards if consistent with street lighting regulations.
 - It is recommended where applicable that low level LED lighting is utilized on footpaths and common areas in the development.
 - General industry standard mitigation measures for noise management are to be included in the CEMP.
 - Low speed traffic movement through the site (e.g. traffic calming measures, speed limit signs) which can be incorporated during the detailed design process.
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