

Environmental Risk Assessment and Mitigation Measures – SSD- 86122958

11 – 23 Rangers Avenue Mosman

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 *Draft Environmental Impact Assessment Guidance Series* released by DPHI 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.

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	Approach	Mitigation Measure (Pe/Pr/Ma)
Traffic, Transport & Parking	Impacts of the construction of the development on the traffic and pedestrians	C	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, ▪ parking, ▪ heavy vehicle routes, ▪ pedestrian/cyclist safety, ▪ vehicle/site safety, ▪ emergency access, and ▪ driver code of conduct.	Ma
Traffic, Transport & Parking	Impacts of the operation of the development also with regard to sustainability and climate change	O	The operational design and traffic management includes general principles of traffic management during operation activities once the development is complete are as follows: ▪ Provide a single driveway access on Rangers Avenue designed to allow safe two-way vehicle movement, reducing potential vehicle conflict and improving safety. ▪ Remove four existing driveways on Bloxsome Lane to improve pedestrian safety and reduce vehicle conflict with vehicles entering/exiting the site. ▪ Ensure on-site parking for residents and visitors meets Housing SEPP and Mosman DCP requirements to avoid overflow parking impacts on surrounding streets. ▪ Provide accessible parking spaces in excess of minimum requirements to ensure equitable access for all users.	Ma

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			- Provide bicycle and motorcycle parking in compliance with Council standards to encourage active transport and reduce reliance on private vehicles. - Undertake waste collection from Rangers Avenue frontage using the kerbside parking lane to minimise disruption to traffic flow. - Make visitor parking available for couriers and small deliveries to avoid double-parking or obstruction of traffic lanes. - Maintain safe pedestrian routes to Bloxsome Lane and Cremorne town centre via existing stairs and Stuart Walk to support walkability and connectivity. - Provide a bicycle parking room on the ground floor to facilitate secure and convenient storage for residents and visitors. - Limit traffic generation to a forecast 3–4 vehicle trips in peak hours, ensuring negligible impact on the surrounding road network. - improve traffic performance on Bloxsome Lane through driveway removal, reducing vehicle movements and potential conflict points.	
Noise and Vibration	Impacts of the construction of the development on surrounding properties	C & O	<u>Construction Noise and Vibration</u> - Apply all feasible and reasonable work practices to minimise noise impacts, in line with the NSW EPA Interim Construction Noise Guideline (ICNG). Restrict works to standard construction hours unless otherwise approved: 7 am to 6 pm (Monday to Friday) 8 am to 1 pm (Saturday) - No work on Sundays or public holidays - Where works are outside standard hours, provide strong justification and consult with the community.	Ma

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			- Inform potentially impacted residents of the nature, timing, and duration of works, expected noise levels, and contact details. - For highly noise-affected situations (>75 dBA), consider respite periods and adjust work hours in consultation with the community	
			Construction Traffic	
			- Access the site via Rangers Avenue. - Manage construction traffic to avoid significant increases in road traffic noise (limit to <2 dB increase).	
			Vibration Management	
			- Maintain safe working distances for vibration intensive plant as per Table 21 in the report (e.g., rollers, hydraulic hammers, pile drivers, jackhammers). - Validate safe distances at the start of works by measuring vibration levels if plant is used within recommended distances. - If sensitive scientific/medical equipment is nearby, assess vibration impacts against more stringent criteria.	
			Noise Monitoring	
			- Undertake attended noise monitoring: - At the start of each new work phase (demolition, excavation, construction). - In response to noise complaints. - Measure LAmin, LA90, LA10, LA01, LAmx, LAeq over 15 minute periods. - Use attended monitoring to distinguish construction noise from other sources and identify noisy plant	
			Vibration Monitoring	
			Undertake continuous vibration monitoring at the nearest affected structures if required by consent conditions.	

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			- Place monitors on a stiff part of the structure (foundation) closest to works. - Configure monitoring to trigger alarms at: Operator Warning Level = 75% of halt threshold. Operator Halt Level = threshold based on building damage criteria. - On exceeding the Halt Level, cease works and implement alternative methods. Community Consultation - Provide clear communication channels for complaints and enquiries. Respond promptly to any noise or vibration complaints with investigation and, if necessary, additional mitigation. Operational Noise - Provide acoustic louvres on L8 air conditioning plant room (IAC Acoustics Slimshield SL-150).	
Noise and Vibration	Impact of the future development on the surroundings	O	<u>Operational Noise</u> Building Envelope and Acoustic Treatments - Install external glazing to all façades as follows: - Bedrooms: 6.38 mm laminated glass, minimum Rw 30. - Living rooms: 6.38 mm laminated glass, minimum Rw 30. - Wet areas: 6.38 mm laminated glass, minimum Rw 30. - Common areas: 6.38 mm laminated glass, minimum Rw 30. - All glazing to be installed with acoustic bulb seals and frames to maintain performance.	Pe

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			▪ Lightweight external plasterboard walls to achieve a minimum acoustic performance of Rw 45. ▪ All openings and penetrations (including mechanical service grilles, ventilation openings, ductwork) to be acoustically treated so façade performance is not compromised. ▪ Concrete external roof construction requires no additional acoustic treatment. <u>Mechanical Services</u> ▪ Select and locate all mechanical plant to ensure compliance with the project's operational noise criteria. ▪ Apply high-performance acoustic treatments to plant and equipment as required, including: - Internally lined ductwork or acoustic silencers for supply and exhaust fans. - Acoustic flex ducting or internally lined ducting for small exhaust/supply fans (toilets, kitchens, lobbies). - Screening and/or exhaust treatment for residential condenser units. - Silencers and internally lined ductwork for rooftop plant. ▪ Undertake a detailed acoustic assessment prior to the Construction Certificate to confirm cumulative noise from all engineering services complies with criteria. <u>Waste Collection</u> ▪ Conduct waste and garbage collection in accordance with Council's waste management requirements. ▪ Use approved waste collection vehicles; collections to be intermittent and acoustically acceptable.	

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Social Impact	Potential social impacts as a result of the development	C & O	<u>Construction management</u> ▪ Prepare and maintain an adequate Construction Management Plan (CMP), updated as construction progresses, to address potential negative social impacts such as noise, dust, traffic disruption, and access changes. ▪ Scheduling of disruptive works (e.g. demolition, high noise activities) to reduce impacts on people working from home, older residents, and children in nearby dwellings. ▪ Clear communication of traffic and pedestrian changes during construction, including: - Advance notice to residents and businesses. - Provision of safe, barrier free alternative access routes. - Clear signage for detours and temporary pathways. ▪ Ongoing engagement with surrounding residents and businesses before and during construction to build trust and acceptance, including: - Dedicated email/phone contact for information, complaints, or issues. - Notices outlining construction timelines, expected impacts, and standards to be met. ▪ Proactive management of cumulative impacts from other nearby projects, especially regarding traffic, access, and amenity. ▪ Minimise interruptions to utilities and services (electricity, water, telecommunications, gas) for neighbouring properties. Design and maintain temporary fencing and hoardings to reduce visual amenity loss and maintain safety. <u>Operational Management</u>	Pr, Ma

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			- Design communal spaces to be welcoming and inclusive, encouraging social interaction and cohesion among residents and visitors. - Provide approximately 900 m² of landscaped communal open space in addition to private balconies, designed to maximise accessibility for all residents and minimise noise impacts on neighbours. - Ensure affordable housing component (15% GFA) is managed by a registered Community Housing Provider to maintain effective long-term management and integration within the strata. - Incorporate Universal Design and CPTED (Crime Prevention Through Environmental Design) principles to ensure all private and public areas are physically accessible, inclusive, and safe. - Provide adequate lighting at all entry points to ensure residents can arrive and leave safely. - Ensure clear entry points for vehicles and pedestrians, with passive surveillance from apartments over communal and public spaces. - Maintain safe and accessible pedestrian and vehicle routes in and around the site, prioritising barrier-free movement for people with disability, older residents, and parents with prams. - Ongoing engagement with the local community to manage perceptions of change, address concerns, and maintain positive relationships post-completion. - Monitor and adaptively manage social impacts over time, responding to unanticipated events, breaches, grievances, and non-compliance	
Flood Risks	Potential impact on future development	C	The following mitigation measures must be implemented during the design and construction phases: The minimum the flood planning/protection level for ground area is RL 48.7 m AHD which is above the adopted flood planning level (0.5% AEP event at approx. 40–45m AHD).	Ma

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			- The proposed basement entrance and adjacent top of kerb to maintain a freeboard of approximately 200 mm for extra protection from localised surface runoff. - The northern boundary wall on Bloxsome Lane will be designed to redirect any overland flow towards public thoroughfares located east and west of the site, thereby preventing inundation of residential dwellings.	
Aboriginal Cultural Heritage	Impact on existing heritage significance	C	- A formal Unexpected Finds Procedure must be in place for the duration of all demolition and construction activities. This procedure will outline clear steps for stopping work, securing the area, and notifying the appropriate authorities and Aboriginal stakeholders if any suspected Aboriginal objects or cultural material are uncovered. - All personnel involved in ground disturbance will be briefed on the low but possible presence of Aboriginal engravings or markings on sandstone. Training will include recognising potential Aboriginal cultural material and understanding the UFP process	Ma
Environmental Heritage	Impacts of demolition on existing environmental heritage significance	C	- A Photographic Archival Recording of the existing dwellings must be undertaken prior to demolition. The purpose of the archival recording is to document the rock wall along the length of Ranger Road prior to the modification at 11 Rangers Road. As well as to document the existing setting, and the extant houses of the area. The Archival Recording must be prepared in accordance with the Heritage NSW Guidelines for 'Photographic Recording of Heritage Items Using Film or Digital Capture'. - Retention and protection of the rock wall and sandstone retaining wall (23-17 Rangers Avenue), identified in the Mosman Residential DCP during all works. - A schedule of conservation works should be prepared for the elements of rock wall that are stone blockwork to conserve the wall into the future.	Ma

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Water Management	Impacts of stormwater for the proposed residential development	C & O	- Constructing a pit-and-pipe network along Rangers Avenue to manage runoff from the site and the upstream catchment to the culvert / pipe between Park Avenue and Avenue Road as per the meeting with Council on 18/03/2026. - A 67m³ is proposed to be installed in the tank to limit the PSD to 90L/s in the 5% AEP storm event - The installation of 4x OceanGuard from Ocean Protect and an SF chamber with 3x 690Psorb filters to manage water runoff quality.	Pr
Ground & Ground water conditions	Impacts of the construction of the development on surrounding ground and groundwater conditions	C & O	<u>Operational Phase Dewatering Management</u> Pretreatment sample water to be analysed for dewatering parameters and appropriate treatment as outlined in the Hydrogeological Report and Dewatering Management Plan and Groundwater Seepage Analysis. The appropriate watering system will then be established to discharge water quality. The Strata Management is responsible for: - maintenance of the water treatment system to ensure discharged water complies. - Ensuring annual reporting and dewatering monitoring for the occupational phase of the project Monitoring and Frequency - Groundwater levelling monitoring scheduled for the first 36month of operation is required of the sump and pump operational phase in order to characterise seasonal groundwater fluctuations - Discharge volume: A quarterly groundwater monitoring frequency for the first 12 months of operation, every 6 months for year 2 and a single at year 3) - Water quality monitoring: The volume of discharge water must be monitored and recorded by a calibrated flow meter as part of the long term pumping system.	Ma

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			- Annual Dewatering monitoring report: A single post treatment water quality test every 12 months (annually) alongside a factual, 12 month interim report – Operational Dewatering prepared by Water NSW Completion report after each 12 months of monitoring. - Cessation of Monitoring: If stabilised after 36 months of operation, and confirm that groundwater quality, groundwater fluctuation levels and annual ground water discharge volume are stable, then it will be determined that equilibrium has been established and termination of the water monitoring program would be justified. The appointed environmental consultant will provide notification to Council to document the termination or continuation of water monitoring at this stage. Monitoring Well Replacement Protocol Existing groundwater monitoring wells are located within the basement footprint area At least one well will be preserved to enable groundwater monitoring close to the basement. Should wells be damaged during constriction. A new groundwater monitoring well will be installed to facilitate groundwater monitoring as per Monitoring Well Replacement Protocol and procedure: - The replacement well must appropriately located so as to avoid any damage or destruction during construction works - Well design in accordance with the design for water monitoring bores for water level monitoring specified under the <i>Minimum Construction Requirements for Water Bores in Australia</i> (Ref. NUDLC, 2020); - The well will be appropriately screened with the water intake interval set across the lowermost basement level to monitor groundwater levels at the bulk excavation level, assuming uniform ground conditions, and	

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			d. All reasonable steps must be taken to have the replacement bore installed within one week of the damage having occurred, subject to licenced driller availability.	
Ground & Ground water conditions	Excavation and foundation related mitigation measures during construction	C	- Dilapidation survey must be carried out on all structure and infrastructures that falls within the zone of influence of the excavation to allow assessment of the recommended vibration limits. - Care must be taken during demolition to avoid damaging neighbouring structures and infrastructure. - At least two test pits along the western and eastern site boundaries must be excavated and inspected by geotechnical and structural engineers to assess in-situ ground conditions at the founding and footing level - Geotechnical inspections of rock faces during excavation by experienced geotechnical professional at depth of no greater than 1.5m with medium to high strength bedrock, if vertical cut are adopted. - Geotechnical inspections of all new footings/piles by an experienced geotechnical professional before concrete or steel are placed to verify their bearing capacity and the in-situ nature of the founding strata - Ongoing monitoring of groundwater inflows into the bulk excavation.	Pr
Contamination & Remediation	Management of the potential for contamination during construction	C	The site can be suitable for the development subject to implementation of the recommendations: - Engage a suitably qualified consultant to complete a hazardous materials survey before demolition works commence. - Appropriately manage all identified hazardous materials during demolition to protect worker health and prevent contamination of ground surfaces. - Following removal of any asbestos-containing material (ACM), obtain clearance inspection and certification from a SafeWork NSW Licensed Asbestos Assessor	Ma

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			▪ If clearance inspection identifies remaining hazardous materials, undertake further delineation, removal, and re-clearance inspection. ▪ Conduct targeted soil investigation in areas where soils will be retained on site ▪ Pre-classify all soil materials designated for off-site disposal, including virgin excavated natural material (VENM), in accordance with EPA (2014) Waste Classification Guidelines ▪ Validate all imported soil/materials as suitable for the intended land use in accordance with EPA guidelines	
Waste Management	Impacts of the proposed development on construction and operational waste generation rates	C	▪ Promote source separation, provide resident education materials, and encourage reuse initiatives to minimise waste generation ▪ Maintain clear signage, ensure correct use of chutes and bins, and follow council guidelines for each waste stream. ▪ Operate in accordance with bin quantities, collection frequencies, and equipment provisions outlined in the OWMP. ▪ Record bin usage, track contamination rates, and review contractor reports to identify improvement opportunities. ▪ Review council and EPA requirements regularly and update waste management procedures and signage as needed	Pr