



Appendix E – Consolidated Mitigation Measures

Consolidated Mitigation Measures

The collective measures required to mitigate the impacts associated with the proposed works are detailed below. These measures have been derived from the assessment in **Section 8.0** of the EIS and those detailed in the appended consultants' reports.

Ref No.	Mitigation Measures
Design and Operation	
Aboricultural	
A-1	Trees T1, T2, T3, T4, T5 and T24 (total of 6 trees) require tree protection measures to be installed. Trees T15 and T19 are adequately protected by existing boundary fencing.
A-2	Root Investigations are recommended to be carried out along the pink highlighted lines (as shown within Appendix 1A) within the TPZ of T2 and T3 to determine if the driveway access and pedestrian footpath can be constructed without significantly impacting the tree.
A-3	Tree protection measures to be installed prior to the commencement of any site activity, inclusive of demolition and installed in accordance with the recommendations made within this report and be compliant to AS4970-2025 Protection of Trees on Development Site.
A-4	All works within the TPZ areas are to be carried out in consultation with the project Arborist who is to monitor the condition of the trees and the site activities throughout the development process.
A-5	All construction activity is to comply with Australian Standard AS4970-2025 Protection of Trees on Development Sites (2025), sections 7, 10 and 11 of this report.
A-6	No services plan has been assessed as part of this report. All underground services located inside the TPZ of any tree to be retained must be installed via tree sensitive techniques. This should include either directional drilling methods or manual excavations to minimise the impact to trees identified for retention. Section 4.5.5 of AS4970-2025 says that 'The directional drilling bore should be at least 600 mm deep. The project Arborist should assess the likely impacts of boring and bore pits on retained trees. For manual excavation of trenches the project Arborist should advise on roots to be retained and should monitor the works.'
A-7	This report does not provide approval for tree removal or pruning works. All recommendations in this report are subject to approval by the relevant authorities and/or tree owners. This report should be submitted as supporting evidence with any tree removal/pruning or development application.
Operational Waste Management	
OWM-1	The waste management measures within the Operational Waste Management Plan prepared by Elephants foot Consulting (Appendix DD) will be incorporated into the detailed design of the development.
Construction Management	

Ref No.	Mitigation Measures
Construction and Demolition Waste Management	
CDM-1	Contaminated material stockpiled on site will be minimised as far as possible and should be stored on HDPE liner, in a bunded location which is protected from inclement weather.
CDM-2	Sediment fences should be installed around the base of stockpiles and the stockpiles should be covered. Where excavated material requires validations, samples should be taken for NATA laboratory testing as per the requirements of the contamination assessment prior to restoration works, backfilling exercises and disposal.
CDM-3	Any trucks carrying contaminated materials should be securely and completely covered immediately after loading the materials (to prevent windblown emissions and spillage) and must be licensed by the NSW Environmental Protection Authority (EPA).
CDM-4	Decontamination of all equipment prior to demobilisation from the site is important so that contaminated materials are not spread off-site.
CDM-5	The following measures and safe guards apply to the development of excavated material: Wherever practical, excavation material will be reused as part of the development.
CDM-6	Excavation material that is not natural (virgin) material will be transported to an approved landfill site or off-site recycling depot.
CDM-7	A waste classification assessment of the fill material should be undertaken prior to it being acceptable for waste disposal purposes.
CDM-8	Transportation routes for excavation material removed from site will be identified and used.
Remediation	
R-1	Borehole BH5 – contains TRH impacted fill to a depth of 0.1m BGL. The delineation of the impacted fill is proposed to be completed as part of the remediation works.
R-2	The RAP also requires the additional sampling to be completed post demolition of site structures to assess beneath the former building footprints, beneath the UST areas and further define the extent of the required soil remediation works at the site.
Erosion and Sediment Control Plan	
ES-1	Prior to the demolition stage and before any construction can take place, erosion and sediment control measures must be set in place. The measures that have been proposed are as follows: - Site security fence surrounding the site - Sedimentation fences around downstream areas, surrounding disturbed areas and any soil stockpiles - Geotextile filter fabric sediment traps - Temporary site access cattle grid - Sedimentation basin in excavated areas - Pump and filtration system

Ref No.	Mitigation Measures
	• Haybales through which the pumped-out water will be discharged as a secondary method of filtration
Construction Traffic Management	
CTM-1	The nominated contractor shall prepare notification letters to advise the following neighbouring properties of the proposed construction works and timing thereof. A minimum notice period of 14 days shall be applicable for all external communication.
CTM-2	The nominated contractor shall also engage with the surrounding building teams at the time of construction to establish the extent of truck delivery movements with an aim to minimise overlapping movements on the same routes.
CTM-3	The following addresses will be notified by letterbox drop prior to the start of works, providing information relating to the project schedule • 259-261 Maroubra Road, Maroubra • 214 Maroubra Road, Maroubra • 237-245 Maroubra Road, Maroubra • 130 Garden Street, Maroubra • 132 Garden Street, Maroubra • 137-139 Garden Street, Maroubra
CTM-4	The nominated contractor will be responsible for ensuring that the road pavement, kerb, gutter and footpath along each road frontage shall remain in clean and serviceable states during the course of the construction at no cost to Council.
CTM-5	The nominated heavy vehicle haulage routes will largely be limited to State Roads and Regional Roads which are designed to accommodate heavy vehicle movements. As such, there will be no adverse impact on existing public transport services. While the nominated truck routes will overlap with bus routes during the construction period, it is not expected that estimated truck movements would have material effect on the existing bus services
CTM-6	A site personnel will be on-site regularly with contact details prominently displayed and visible from the road frontage. Access to the site and neighbouring sites by emergency vehicles would not be affected by the construction activities. There will be no adverse impact on emergency vehicle access to the site or other neighbouring properties as a result of the proposed activities.
CTM-7	The nominated heavy vehicle haulage routes will largely be limited to State Roads and Regional Roads which are designed to accommodate heavy vehicle movements to minimise the impact on immediate local road network. As such, it is not expected to have an adverse impact onto the surrounding road users including cyclists.
CTM-8	To ensure the pedestrian's safety, temporary fencings will be established along the construction site perimeter to cordon off the site from pedestrian movements along the site frontages and neighbouring properties where applicable. All construction-related traffic movements along the frontages will occur under the supervision of on-site trained personnel, with trucks escorted between the site access and associated frontage to ensure pedestrian safety.
Archaeology	

Ref No.	Mitigation Measures
A-1	site induction is to be provided to all employees/contractors engaged for the proposed works for the study area. The induction material should include an overview of the types of sites to be aware of (i.e., artefact scatters), obligations under the NPW Act, and the requirements of an archaeological finds' procedure.
A-2	Archaeological Monitoring Aboriginal archaeological monitoring is to be carried out during ground-disturbing works, including bulk excavation and service trenching. Monitoring will allow confirmation of the extent of disturbance and enable the identification and appropriate management of any potential Aboriginal objects or intact soil profiles. Should intact deposits or cultural material be identified, works in the affected area should temporarily cease and further archaeological investigation be undertaken as required, in consultation with RAPs and in accordance with applicable legislative requirements. An Aboriginal unexpected finds procedure should remain in place for the duration of all excavation works.
A-3	Aboriginal Unexpected Finds Procedure: Once the site has been signed off and all archaeological testing and/or salvage works have been completed, if the discovery of an archaeological feature that is suspected to be Aboriginal cultural material in nature (excluding human remains- see Recommendation 4 below), the following procedure should be followed: • Cease works in the immediate vicinity of the find. • Contact the project archaeologist to verify the nature of the find. • If Unexpected Find is confirmed as Aboriginal archaeology, project archaeologist will notify RAPs and Heritage NSW of the find. If Unexpected Find is confirmed as not Aboriginal in origin, project archaeologist will provide advice for works to recommence. • Project Archaeologist and RAPs will undertake a preliminary assessment and recording of the find. • Formulate archaeological or heritage management plan- specific to nature of the find. • Implement archaeological/heritage management plan. • Works may recommence once archaeological/heritage management plan has been successfully implemented, and project archaeologist provides sign off to contractor for works to resume in vicinity of find.
A-4	Human Remains Procedure: While not anticipated to be encountered within the study area, the unexpected discovery of any potential skeletal remains during development works would be managed in accordance with the approved Heritage NSW protocol for the discovery of human remains which is stated as: If any suspected human remains are discovered and/or harmed the proponent must: • Not further harm these remains. • Immediately cease all work at the particular location. • Secure the area so as to avoid further harm to the remains. • Notify the local police and OEH's Environment Line on 131 555 as soon as practicable and provide any available details of the remains and their location. • If remains are identified as Aboriginal, notify all RAPs of the discovery. • Not recommence any work at the particular location unless authorised in writing by Heritage NSW.



Ref No.	Mitigation Measures
Noise and Vibration	
NV-1	A suitably qualified consultant (noise and vibration) is to be engaged. Prior to commencement of excavations, all available data should be assessed for the detailed minimum dual level basement design. Client is advised to refer all finished borehole logs, photograph of rock core samples and results of PLI tests to check the strength of the bedrock. It is anticipated that prior to site earthworks and excavations an assessment will be carried out by a qualified excavation contractor to identify a suitable excavation method for SANDSTONE rock Class III.
NV-1	The proposal should be carried out in accordance with the General Control Measures under Section 11.3 of the Acoustical Report in Appendix V .
Geotechnical	
G-1	Vibration Management Plan ("VMP") is considered required to allow for monitoring of the vibration effects caused by bulk site excavation activities on the most of neighbouring properties and road carriageways located along the site boundaries. It is recommended, that a monitoring be carried out using a suitable vibration monitoring device, with appropriately nominated Peak Particle Velocity ("PPV") of 5mm/sec, selected based on the conditions of the surrounding structures. If vibrations on the sensitive neighbouring structures will be then exceeding the recommended 5mm/sec PPV limit, all site construction activities should cease and geotechnical engineer shall be contacted immediately for review of the site conditions.
G-2	Dilapidation survey report on all neighbouring structures and Maroubra Road / Garden Street associated pavements that may be affected by proposed development is recommended to be carried out by a qualified structural engineer prior to commencement of construction. Zone of Influence ("ZOI") can be identified by drawing a 45° line from bottom of the bulk excavation to the natural ground level outside the bulk excavation. Area in between the intersection of 45° line with natural ground level and boundary of bulk excavation is the zone of influence. Subsurface sand layers to the depths of 1.6m – 1.8m were assessed of very loose consistency.
G-3	The sides of the proposed development may be considered suitable for temporary excavation batter slopes, but this assumption is primarily dependent on the architectural and structural engineer designs
G-4	Detailed retaining wall analysis shall be carried out and a suitable shoring pile system adopted based on the structural analysis to reduce earth movement and in order to prevent collapse of excavation boundaries. Piles shall be socketed into a suitable ROCK stratum based on the detailed design and at least 1.0m below the bulk excavation level. Suitable drainage system shall be installed behind the retaining wall system and will be discharged into site stormwater system for long term purposes. The potential amount of groundwater within the site will be primary factor in determining if there are potential excessive groundwater inflows into bulk excavations and it is therefore recommended detailed analysis be carried out.
G-5	The proposed basement cut faces should be supported temporarily during construction and in long-term using appropriate retaining structures. These retaining structures should be designed to withstand the applied lateral pressures of the soil and rock strata, the existing surcharges in their zone of influence (ZOI), such as existing structures, construction related activities, and water pressures if exists.
G-6	It is recommended to principal designer to carry out geotechnical modelling of proposed foundation systems be carried out to determine the magnitude and distribution of settlement occurring under designed working loads, specifically in relation to the close vicinity of nearby structures.
G-7	It is recommended that all foundations are to be founded on the same rock to minimise and avoid potential future differential settlement. Detail design of the foundation system should be carried out by the structural engineer.

Ref No.	Mitigation Measures
G-8	It is recommended that the design and construction of proposed foundation system should incorporate aggressivity and salinity results of the soils
G-9	Earthworks and subgrade preparation should be carried out in accordance with Randwick City However, a general procedure is provided below: • Fill materials or topsoil or any unsuitable materials should be removed from the site. • Excavated materials for reuse as engineering fill or remove to spoil should be stockpiled separately. Exposed surface after excavation should be treated to adjust its moisture condition to not to vary more than 2% from its Optimum Moisture Content ("OMC") and then compacted using at least 12t vibrating compacter to density ratio. • Exposed surface should be tested with appropriate density testing and proof rolling with a smooth drum roller of minimum 10t weight. Soft or loose areas should be excavated, treated with moisture and replaced with appropriate imported fill Council specifications and AS 3798-2007.
Groundwater	
GW-1	It is recommended that groundwater monitoring be carried out during the excavation stages to confirm the assumptions of the Groundwater Seepage Analysis.
Detailed Site Investigation	
DSI-1	Any soil requiring removal from the site, as part of future site works, should be classified in accordance with the "Waste Classification Guidelines, Part 1: Classifying Waste" NSW EPA (2014).
DSI-2	Is considered that the site could be deemed suitable for the proposed development subject to the implementation of a Remediation Action Plan (RAP) to manage the abovementioned environmental concerns and data gaps.
Hazardous Materials	
HM-1	Asbestos Material: Through field examination and sampling, asbestos material were identified at the site. Licences removal is required for asbestos containing material. Caution should be taken during the demolition process. If asbestos was identified refer to hazardous materials register and photos for asbestos containing materials and their locations.
HM-2	Synthetic Mineral Fibres (SMF): Through field examination and sampling, SMF materials were identified at the site. Confirmed SMF materials should be removed under controlled conditions prior to renovation or demotion works. Refer to hazardous materials register and site plan.
HM-3	Polychlorinated Biphenyls (PCBs): Confirmed fluorescent lights containing cadmium/PCB capacitors should be removed under controlled conditions by a licensed contractor prior to renovation or demolition works. Through field examination cadmium/PCB capacitors are expected to be present within the fluorescent lighting. A more detailed inspection and/or sample analysis requires a qualified electrician to isolate and de-energise the lights.
HM-4	Chlorofluorocarbon (CFCs): Refrigerants and air conditioning units should be removed under controlled conditions by a licensed contractor prior to renovation or demolition works. Through field examination vapour compression cycles containing CFCs are expected to be present within the refrigerators and air conditioning units. A more detailed inspection and/or laboratory analysis would require a qualified refrigeration specialist who holds a Refrigerant Handling Licence to assess the vapour compression cycle.
HM-5	Paint Containing Lead: Through field examination and sampling, paint containing lead was identified at the site. Confirmed paint containing lead should be managed in accordance with "Guide to Lead Paint Management – Part 2: Residential and Commercial Buildings [AS 4361.2 – 2017]" If paint containing lead was identified refer to hazardous materials register and photos for sample locations.

Ref No.	Mitigation Measures
HM-6	Dust Containing Lead: Through field examination no areas of excessive dust/debris were encountered in the inspection areas. Confirmed dust containing lead should be removed under controlled conditions prior to renovation or demolition works in accordance with “Guide to Lead Paint Management – Part 2: Residential and Commercial Buildings [AS 4361.2 – 2017]”.
Heritage Impacts	
HI-1	Engagement of Structural Engineer Given the proximity of the local heritage items, in particular “ <i>Crossley Court</i> ”, group of inter-war commercial and residential buildings (Randwick LEP #1505), located at 237–245 Maroubra Road, it is recommended that a suitably qualified structural engineer should be engaged to provide advice on potential impacts of the proposed bulk excavation and basement construction on the structural integrity of these heritage buildings. The structural engineer should advise on: • whether dilapidation reporting is required (including baseline photographic and measured condition survey), • whether vibration and/or settlement monitoring is required during excavation and construction, and • any construction methodology controls (e.g. sequencing, shoring/retention systems, vibration thresholds, hold points) necessary to minimise risk and conserve the physical integrity of nearby heritage fabric.
Heritage Impacts	
HI-1	Engagement of Structural Engineer Given the proximity of the local heritage items, in particular “ <i>Crossley Court</i> ”, group of inter-war commercial and residential buildings (Randwick LEP #1505), located at 237–245 Maroubra Road, it is recommended that a suitably qualified structural engineer should be engaged to provide advice on potential impacts of the proposed bulk excavation and basement construction on the structural integrity of these heritage buildings. The structural engineer should advise on: • whether dilapidation reporting is required (including baseline photographic and measured condition survey), • whether vibration and/or settlement monitoring is required during excavation and construction, and • any construction methodology controls (e.g. sequencing, shoring/retention systems, vibration thresholds, hold points) necessary to minimise risk and conserve the physical integrity of nearby heritage fabric.
HI-2	Maintain and protect the Garden Street streetscape setting Retain and protect the existing mature street trees along the Garden Street verge (as proposed), including tree protection zones, supervised works near roots, and contingency measures if any pruning or removal becomes necessary. This is important to conserve the established streetscape character that contributes positively to the public setting of Crossley Court.
HI-3	Public art/interpretation



Ref No.	Mitigation Measures
	Details of future public art or interpretation to be included within the dedicated vertical band along the northern elevation should be reviewed by a heritage specialist to ensure that the artwork respects the immediate heritage setting.