Appendix M Mitigation Measures Table

Mitigation Measures Table			
Condition No.	**Mitigation Measures**	**Timing**	**Reference**
Construction Management Plan			
CM1	A Construction Management Plan (CMP) must be prepared prior to the issue of a Construction Certificate. The CMP is to address, at a minimum, the following matters: • Noise and vibration management; • Waste classification and disposal procedures; • Erosion and sediment control measures; and • Community consultation and complaints handling protocols.	Prior to construction	-
CM2	Construction works must be undertaken in accordance with the Interim Construction Noise Guideline (ICNG) standard hours of operation, as follows: • Monday to Friday: 7:00 am to 6:00 pm; • Saturday: 8:00 am to 1:00 pm; • Sundays and public holidays: No works permitted.	During construction	-
Safety and Security			
SS1	The design has been assessed against the Crime Prevention Through Environmental Design (CPTED) principles which must continue to be implemented as designed throughout design development and construction.	Prior to construction and during construction	Section 7.18.2 of the EIS
Traffic, Transport and Accessibility			
TA1	A detailed Construction Traffic Management Plan (CTMP) must be prepared which expands on the preliminary CTMP and addresses the following at a minimum: • A description of the development. • Location of any proposed work zone(s). • Details of any alteration/s to the traffic arrangements on Memorial Avenue, including any lane closures. • Details of crane arrangements including location of any crane(s) and crane movement plan. • Haulage routes. • Proposed construction hours. • Predicted number of construction vehicle movements, detail of vehicle types and demonstrate that proposed construction vehicle movements can work within the context of road changes in the surrounding area, noting that construction vehicle movements are to be minimised during peak periods. • Construction vehicle access arrangements. • Construction program and construction methodology, including any construction staging. • A detailed plan of any proposed hoarding and/or scaffolding.	Prior to construction	Appendix N

Mitigation Measures Table			
Condition No.	**Mitigation Measures**	**Timing**	**Reference**
	• Measures to avoid construction worker vehicle movements within the precinct. • Consultation strategy for liaison with surrounding stakeholders, including other developments under construction. • Identify any potential impacts to general traffic, cyclists, pedestrians, and bus services within the vicinity of the site from construction vehicles during the construction of the proposed works. Proposed mitigation measures should be clearly identified and included in the CPTMP; and • Identify the cumulative construction activities of the development and other projects within or around the development site. Proposed measures to minimise the cumulative impacts on the surrounding road network should be clearly identified and included in the CPTMP.		
TA2	Preparation and implementation of a detailed Green Travel Plan (GTP) to expand upon the preliminary GTP, which includes target mode shares to reduce the reliance on private vehicles.	During occupation	Appendix N
Transport for NSW Conditions			
TNSW 1	The redundant driveway on the Memorial Avenue boundary must be removed and replaced with kerb and gutter to match existing. The design and construction of the kerb and gutter on Memorial Avenue must be in accordance with TfNSW requirements. Detailed design plans of the proposed kerb and gutter are to be submitted to TfNSW for approval.	Prior to issue of CC	-
TNSW 2	Detailed design plans and hydraulic calculations of any changes to the stormwater drainage system are to be submitted to TfNSW for approval, prior to the commencement of any works.	Prior to construction	-
TNSW 3	Design drawings and documents relating to the excavation of the site and support structures are to be submitted to TfNSW for assessment, in accordance with Technical Direction GTD2020/001. If it is necessary to excavate below the level of the base of the footings of the adjoining roadways, the person acting on the consent shall ensure that the owner/s of the roadway is/are given at least seven (7) day notice of the intention to excavate below the base of the footings. The notice is to include complete details of the work.	Prior to construction	-
TNSW 4	Any public utility adjustment or relocation works on the state road network will require detailed civil design plans for road opening / underboring to be submitted to TfNSW for review and acceptance prior to the commencement of any works. The proponent must also obtain necessary approvals from the various public utility authorities and/or their agents.	Prior to construction	-
TNSW 5	A Road Occupancy Licence (ROL) should be obtained from Transport Management Centre (TMC) for any works that may impact on traffic flows on Memorial Avenue during construction activities.	Prior to construction	-
Noise and Vibration			
NV1	The following project specific noise mitigation strategies are recommended to protect the amenity of surrounding properties during highly concentrated and loud activities: • A respite period is to be implemented where excavator-mounted hydraulic hammering works are required and will generate noise levels exceeding the highly noise-affected levels • Ongoing community consultation must occur throughout the construction period. • Careful selection and maintenance of plant equipment.	During construction	Appendix O

Mitigation Measures Table			
Condition No.	**Mitigation Measures**	**Timing**	**Reference**
	• A clear complaints-handling procedure must be in place. • Vibration monitoring must be undertaken during excavation phases.		
NV2	The recommendations set out in section 7.4 of the Acoustic SSDA Assessment must be implemented during works and incorporated into the Construction Management Plan (CMP) required under condition CM1.	During construction	Appendix O
NV3	The recommendations set out in section 4, 5 & 6 of the Acoustic SSDA Assessment must be integrated into the design development phase to ensure the development achieves compliance with the established internal noise criteria.	During construction	Appendix O
Design Measures			
DC1	The design recommendations contained within the Pedestrian Wind Environment Statement are to be implemented into the detailed design drawings.	Prior to construction	Appendix I Pedestrian Wind Environment Statement
Geotechnical Requirements			
GR1	For areas of the site where site levels are to be raised, the following general site preparation measures for construction of engineered fill is required: • Strip uncontrolled (i.e. existing) fill, topsoil, and any root-affected material from areas where engineered fill is to be placed. Topsoil / root affected material should not be re-used as engineered fill, but may be stockpiled separately for re-use in landscaping; • Form horizontal benches, with the stripped surface to be test-rolled using a minimum 12-tonne smooth drum roller in static mode. The surface should be rolled a minimum of six times, with the last two passes observed by an experienced geotechnical engineer to detect any soft or heaving areas. Areas identified through test rolling to be soft, heaving or otherwise unsuitable should be removed as directed by the geotechnical engineer, backfilled with clean 'select' fill placed in layers of a maximum 250 mm (loose) thickness, and compacted to a minimum of 98% relative to Standard maximum dry density ratio and to within 2% of the Optimum moisture content for Standard compaction ('SOMC'); • Reinstated surfaces are to be subsequently re-assessed by the geotechnical engineer to confirm that the extent of rectification work is adequate; • Exposed surfaces are to be compacted to a minimum of 98% relative to Standard maximum dry density ratio, maintaining the moisture content of the surface to within 2% of 'SOMC', with the preference for moisture contents to be at -0% / +2% (wet) of optimum ('SOMC'); and • Placement of suitable site-won or imported materials in layers of 250 mm maximum (loose) thickness, thoroughly mixing in water using a heavy rotary disc / hoe, followed by compaction using a minimum 12 tonne smooth drum roller, maintaining the moisture content of the fill within the range -1% (dry) to +3% (wet) of 'SOMC	During construction	Appendix R
GR2	Where structures are to be supported on grade (including pavements and floor slabs), inspection and testing of the fill should be carried out to a 'Level 1' standard by an earthworks laboratory, as defined in Australian Standard 3798 (AS 3798, 2007).	During construction	Appendix R

Mitigation Measures Table			
Condition No.	**Mitigation Measures**	**Timing**	**Reference**
	Engineered fill compacted in accordance with the measures outlined in this report may experience long-term settlements in the order of 0.3% - 0.5% of the fill depth over a log cycle of time		
GR3	The following matters are noted with respect to the excavation conditions: • Excavation of medium strength shale (or stronger) will require the use of larger excavation equipment (such as a D9 bulldozer, or larger), possibly in conjunction with ripping tines and rock hammer mounted on an excavator; • Detailed excavations for footings and services (or side trimming) within medium strength rock will generally require the use of a rotary rock saw or milling head, possibly in conjunction with a hydraulic rock hammer or vibrating rock ripper; • A suitable bulking factor should be applied to the excavated materials, to allow for the increase in volume of the materials due to excavation and disturbance. A suggested bulking factor for the residual clay (from 'undisturbed' to 'excavated') is in the range 1.3 to 1.6.	During construction	Appendix R
GR4	During completion of site preparation works, temporary batter slopes of not more than 1.5 m high within existing fill and natural clay soils should be graded not steeper than 1H:1V (45 degrees).	During construction	Appendix R
GR5	Permanent batters should be graded not steeper than 3.5H:1V (18 degrees) given the presence of dispersive soils. Permanent batter faces should be protected with shotcrete or vegetation, with adequate drainage provided at batter crests. Batters greater than 1.5 m height (temporary or permanent) should be assessed by a geotechnical engineer.	During construction	Appendix R
GR6	Shoring walls around the perimeter of the basements should be extended below the bulk excavation level. The final basement structure should incorporate a retaining wall system. Shoring may include: • anchored soldier piles at maximum nominal 3.0 m centres and concrete infill panels; • contiguous pile walls, with secant pile walls adopted where "cut-off" walls are required to manage groundwater; • sheet piles may be considered, subject to their limitations such as depth of penetration into weathered rock	Prior to construction	Appendix R
GR7	Some sections of shoring will need to be supported by internal bracing and/or ground anchors to control deflections. The shoring walls should be founded in rock at least 1m below the base of the bulk excavation level.	Prior to construction	Appendix R
GR8	All footings for the proposed structures should be uniformly founded on rock with similar strength/stiffness, to reduce the potential for differential settlement.	Prior to construction	Appendix R
GR9	Where bored piles are used on site allowance should be made for the removal of seepage water from open pile excavation holes. Continuous flight auger (CFA), concrete-injected piling methods would eliminate the need for casing or the pumping of seepage inflow (water) prior to concrete placement.	Prior to construction	Appendix R
GR10	All footings/piles should be inspected by a geotechnical engineer to confirm that foundation conditions are suitable for the design parameters.	During construction	Appendix R
GR11	Subgrade soils must be prepared into a well-compacted condition, free of significant adverse long-term or differential settlements under service loading. Flexible-type pavements would be preferred at this site due to the potential for long-term shrink-swell soil behaviour. Pavement design is to consider the following:	Prior to construction and during construction	Appendix R

Mitigation Measures Table			
Condition No.	**Mitigation Measures**	**Timing**	**Reference**
	• The potential that the actual subgrade CBR value within some areas of the prepared pavement subgrade (following the completion of earthworks) may be less than the design subgrade CBR, which would either require rectification work to be carried out or a greater pavement thickness constructed; • Undertaking CBR tests on the prepared surface after the completion of earthworks, to confirm the ongoing validity of the preliminary design CBR value; • The loads applied to the various pavements over their design life, including normal road vehicle pavements, commercial in-service truck loads and possibly construction machinery loads; • The magnitude and frequency of load repetitions of the various vehicles using each pavement • The need to provide edge constraints to the pavement, particularly along the crest of batters, immediately behind retaining walls and along the edge of landscaped areas • The position and grading of subsurface drainage lines, particularly with reference to pavement edges and internal landscaped openings; • Pavement surface gradients and water flow to drainage lines. One-way cross fall pavements may be beneficial, otherwise regularly spaced and centralised drainage collection pits should be installed; • The backfilling and compaction of service trenches; and • The ability of any filled subgrade to carry the load of the pavement.		
GR12	Ground conditions are to be considered at least 'mildly' aggressive to both buried concrete and steel in accordance with the criteria in Australian Standard 2159: 2009.	Prior to construction	Appendix R
GR13	The following management strategies are to be generally implemented with respect to salinity within the site: • Minimise exposure of slightly to moderately saline soils in temporary excavation phases; • Minimise exposure of slightly to moderately saline soils in stockpiles during site works; • Minimise potential for ponding or water logging areas on the site; • Provision of lining in temporary ponds with non-saline clays to minimise groundwater recharge through the soils; • Excavated slightly to moderately saline soils disposed of within locations where salts cannot be leached to the environment; • Drainage infrastructure in vulnerable areas to be installed as soon as practical to avoid excessive water infiltration, ponding of water on site and salt leaching; • Imported material should be tested for salinity to avoid importing saline soils; • Roads should have well designed sub soil drainage; • In fill areas place the soils with highest salinity at the deepest levels; • Application of gypsum to areas of exposed slightly to moderately saline soils if applicable; • Concrete of suitable strength and reinforcement cover is to be used for drainage structures and wherever contact with water and increased soil moisture is expected; • Pipes used for stormwater drainage should be sealed to minimise the risk of leakage;	During construction	Appendix T

Mitigation Measures Table			
Condition No.	**Mitigation Measures**	**Timing**	**Reference**
	• Soils that are excavated from either roads or service trenches throughout areas or the site found to be slightly to moderately saline should be re-instated at the same horizontal level or lower where possible; and • Conduct a comprehensive post-earthworks salinity assessment to determine the final salinity status.		
GR14	Further hydrogeological investigations and analysis must be undertaken to inform the basement design. The analysis undertaken must consider: • Information on baseline creek flows; • Extraction limits from the creek; and • Minimum water levels and flow rates to be maintained.	Prior to construction	Appendix S
GR15	An ecologist must be engaged to analyse the nature and extent of the groundwater dependent ecosystems (GDE) and undertake an assessment of their significance. The results of the analysis are to inform the basement design.	Prior to construction	Appendix S
GR16	Where it has been confirmed that a Water Access License (WAL) from NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) is required for the purpose of groundwater discharge during construction, then this must be obtained.	Prior to construction	Appendix S
GR17	Where it has been confirmed that a Water Access License (WAL) from NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) is required for the purpose of groundwater discharge for a drained basement, then this must be obtained.	Prior to construction	Appendix S
GR18	A dewatering management plan is to be prepared to manage the impacts of dewatering. During construction, drawdown outside the excavation and near to the creek should be monitored in accordance with the following: • Install standpipes in accessible areas adjacent to the development boundaries, to monitor groundwater drawdown levels during dewatering; • Measure groundwater levels on a weekly basis for three weeks prior to operation of the dewatering system, to establish 'pre-construction' levels; • Measure groundwater levels twice per day during the first two days of dewatering, and then daily during the first week of dewatering and weekly until decommissioning of the dewatering pumps, or until a lesser frequency is advised by the geotechnical engineer; • The measured values are to be provided to the geotechnical engineer on the day of measurement for review; • Where drawdown levels exceed a 'trigger level' below pre-construction groundwater levels (to be set), the reason for the change in groundwater level should be investigated and measures put in place to rectify the exceedance. These measures could include reduction of pumping rates or suspension of dewatering.	Prior to construction and during construction	Appendix R Appendix S
GR19	Groundwater extracted from the site during dewatering will require disposal. The contamination status of the groundwater is to be confirmed, and treatment may be required subject to advice from the environmental consultant.	During Construction	Appendix S
Soil and Water Management			

Mitigation Measures Table			
Condition No.	**Mitigation Measures**	**Timing**	**Reference**
SW1	Effective dust control measures must be implemented during all construction and excavation activities.	Prior to construction	Appendix P
SW3	Preliminary erosion and sediment control measures should be implemented through a detailed Construction Management Plan (CMP), as required under condition CM1, and must remain in effect for the duration of the works.	Prior to construction and during construction	Appendix P
Integrated Water Management			
IWM1	Stormwater Quality requirements within Section 4 of the Water Management Report will be implemented with the provision of on-site detention systems, gross pollutant traps and stormwater quality improvement devices.	During construction	Appendix Q
IWM2	The Water Sensitive Urban Design Strategy in the Water Management Report must be reviewed in detail prior to operation, and a site-specific maintenance schedule and checklist should then be implemented.	During construction and during occupation	Appendix Q
Flooding			
FL1	The site is flood affected and minimum habitable floor levels must be achieved in accordance with the Flood Impact Risk Assessment.	Prior to construction	Appendix G Flood Impact Risk Assessment
FL2	The proposed development must be managed in accordance with the measures detailed in the Flood Evacuation Emergency Management Plan (FEEMP) which provides for Shelter-In-Place measures during a potential Probable Maximum Flood (PMF) event.	During operation	Appendix H FEEMP
FL3	The FEEMP must be made available to all residents of all building and there shall be clear signage provided for the egress routes on the lower ground floor to show clear signage and guidance to stairwells for safe shelter.	During operation	Appendix H FEEMP
Aboriginal Cultural Heritage			
AC1	Consultation with the Registered Aboriginal Parties (RAPs) regarding the project should continue, to keep RAPs informed about the management of Aboriginal cultural heritage within the study area.	During construction	Appendix BB & CC
AC2	The management strategies detailed in section 2 of the Aboriginal Cultural Heritage Management Plan (ACHMP) are to be adhered to with respect to the salvage and relocation of artefacts.	Prior to works commencing	Appendix BB & CC
AC2	All employees, contractors, and subcontractors engaged in the project should attend an Aboriginal heritage induction. This induction should highlight the cultural significance of Aboriginal heritage, make clear that harming Aboriginal objects is an offence, and outline individual responsibilities under the *National Parks and Wildlife Act 1974*.	During construction	Appendix BB & CC
AC3	Unexpected Finds and Human Remains Procedure: In the event that Aboriginal objects or skeletal remains are uncovered during redevelopment works, all activities in the immediate area should stop, and the project's heritage consultant should be notified for further direction in line with section 3.1 of the ACHMP.	During construction	Appendix BB & CC

Mitigation Measures Table			
Condition No.	**Mitigation Measures**	**Timing**	**Reference**
Environmental Heritage			
EH1	Unexpected Finds: If any relics are unexpectedly uncovered during redevelopment of the site, all work in the vicinity should cease and the project's heritage consultant should be contacted for advice.	During construction	-
EH2	All personnel involved in the project, including employees, contractors, and subcontractors, should receive guidance on the requirements of the NSW Heritage Act and their obligations under it.	During construction	-
Social Impact			
SI1	Opportunities should be considered to promote visitation by residents, visitors and the wider community in order to increase activation and support community interaction. This may include targeted event programming or use of the shared space for community activities.	During operation	Appendix Z
Biodiversity			
B1	The following measures are to be adhered to prior to and during works: • Pre-clearance surveys should be undertaken prior to vegetation removal to identify any fauna or habitat by an ecologist or suitably experienced personnel; • Adopt clearing protocols to manage wildlife by ecologist or suitably experienced personnel; • Clearing protocols are to be instigated to limit inadvertent clearing; • Only conduct clearing and operation of machinery inside of typical work hours; • Implement industry practice controls of dust as part of bulk earthworks; • Avoid vegetation removal during southern myotis breeding season; and • Carry out site inductions to explain environmental significance of the subject land.	Prior to works commencing and during construction	Appendix Y
B2	The development is required to offset the impact of the development through the retirement of credits for *Cumberland Plain Woodland in the Sydney Basin Bioregion* in accordance with the requirements of the Biodiversity Development Assessment Report.	Prior to occupation	Appendix Y
B3	A Vegetation Management Plan (VMP) should be prepared to provide for the rehabilitation of western edge of the riparian corridor.	Prior to occupation	Appendix Y
Tree Protection			
TP1	Implement the recommendations for tree protection and management in sections 8, 9 and 10 of the Arboricultural Impact Assessment Report must be followed during demolition and construction works.	Prior to construction and during construction	Appendix W
Contamination and remediation			
CR1	With respect to the potential for contamination within the site the following measures are to be undertaken: • A supplementary contamination assessment is undertaken beneath the building footprints following demolition; • A hazardous building materials survey of the structures present on-site prior is undertaken prior to demolition; • A Dam Dewatering Assessment is undertaken prior to any dam-dewatering activities;	Prior to demolition and during construction	Appendix V

Mitigation Measures Table			
Condition No.	**Mitigation Measures**	**Timing**	**Reference**
	• The septic tank within the site is removed under the supervision of an appropriately experienced environmental consultant with subsequent validation sampling to be undertaken following removal; • Following removal of hazardous building materials (if identified) and subsequent demolition of the building materials, a clearance inspection should be carried out by an appropriately qualified occupational hygienist / NSW LAA; and • A waste classification assessment should be carried out on any soil materials proposed for disposal offsite as per the NSW EPA Waste Classification Guidelines (2014).		
Environmentally Sustainable Development			
ES1	The development will implement the following initiatives as detailed in the ecologically sustainable development (ESD) report: • Adhere to the BASIX Certificate water and energy targets; • Will achieve the average 7.4 star NatHERS rating; • High efficiency air conditioning systems; • All electric development with the exception of gas hot water and oven cooktops; • High star ratings for fixtures fittings and appliances with regards to both energy and water; • Provision of rooftop solar panels, targeting a minimum 99kWp rooftop PV system across the rooftops; • Water harvesting for reuse within the site including the installation of 2 x 30kL rainwater tanks; and • Utilisation of construction materials to lower the environmental impact of the development.	During construction	Appendix X
Waste Management			
WM1	The Construction and Demolition Waste Management Plan (CDWMP) must be implemented and monitored during construction. • Site-specific measures relating to inductions, material selection and ordering, waste minimisation opportunities, and site procedures outlined in section 4 of the Construction and Demolition Waste Management Plan should be incorporated into the detailed Construction Management Plan (CMP) required under condition C1.	During construction	Appendix FF
WM2	The requirements of the Operational Waste Management Plan, including waste collection procedures and stakeholder responsibilities, should be implemented throughout the operation of the development.	During operation	Appendix EE
Endeavour Energy			
EE1	Padmount substation(s) required for the purpose of the development must be located within the property (in a suitable and accessible location) and be protected (including any associated cabling not located within a public road / reserve) with an appropriate form of property tenure in accordance with Endeavour Energy's 'Land Interest Guidelines for Network Connection'.	Prior to construction	-
EE2	A Level 3 Accredited Service Provider's (ASP) is to be engaged to confirm the substation location and design complies with Endeavour Energy's standards, the suitability of access, safety clearances, fire ratings, flooding etc.	Prior to construction	-

Mitigation Measures Table			
Condition No.	**Mitigation Measures**	**Timing**	**Reference**
	Should the substation location not comply with Endeavour Energy's standards, then dispensation must be sought from Endeavour Energy.		
EE3	Before commencing any underground activity the applicant must obtain advice from the Before You Dig service.	Prior to construction	-
EE4	The proponent must submit an appropriate application based on the maximum demand for electricity for connection of load.	Prior to construction	-
EE5	No planting of trees is allowed in the easement for a padmount substation. Screening vegetation around a padmount substation should be planted a minimum distance of 800mm plus half of the mature canopy width from the substation easement and have shallow / non-invasive roots. All vegetation is to be maintained in such a manner that it will allow unrestricted access by electrical workers to the substation easement all times.	Prior to construction Ongoing	-