Royal Randwick Racecourse submission to Preferred Infrastructure Report Appendix 2

The following proposed conditions of Approval have been inserted into proposed Environmental Management Measures as recommended in the Submissions Report and PIR (highlighted).

Table 8.1 Revised environmental management measures for the CSELR proposal – detailed design

ID No.	Environmental management measure – detailed design and pre-construction phase
Traffic, transport and accessibility	
A.1	Opportunities to consolidate the existing taxi zones along Devonshire Street (between Chalmers Street and Elizabeth Street) and Chalmers Street (adjacent to the Foveaux Street and Elizabeth Street intersection) into one location adjacent to Central Railway Station in Chalmers Street (south of Devonshire Street, as per the functional road network changes proposed for the operational phase of the CSELR proposal) would be investigated during detailed design in consultation with the City of Sydney.
A.2	The detailed streetscape design of the George Street pedestrian zone would include defined areas for pedestrians and light rail vehicles through visual cues, such as changing pavement types.
A.3	The key actions specified in the detailed access plans for each of the proposed light rail stops, included in section 7.3 of Technical Paper 1 (*Transport Operations Report*) of the EIS (addressing potential multimodal access, customer safety, or to improvements to access) would be further considered during detailed design.
A.4	Opportunities to relocate impacted loading and taxi zones from George Street to the additional kerb provided at the cross streets (for example, converting obsolete turning bays for movements onto George Street into parking) would be further investigated during detailed design (consistent with other changes proposed as part of the Sydney City Centre Access Strategy), in consultation with City of Sydney.
A.5	Parking management measures to improve the future balance between car parking supply and demand and to maintain effective spare capacity to meet varied demands would be investigated during detailed design. Transport for New South Wales would work through implementation of these measures to manage kerbside activity with City of Sydney and Randwick City Council.
A.6	For the Kingsford sub-precinct, controls on remaining parking spaces (to restrict parking to key uses and removing unrestricted parking) would be investigated during detailed design with the aim of maximising the benefit of available parking capacity for high priority users (including disabled, servicing and loading, short stay parking for local business and long stay for residents). Transport for New South Wales would work through implementation of these measures to manage kerbside activity with Randwick City Council.
A.7	Opportunities to relocate existing disabled parking space on High Street (between Clara Street and Hospital Road) to Clara Street (at the intersection with High Street) would be investigated during detailed design, in consultation with Randwick City Council.
A.8	Permanent changes to access arrangements and local traffic movement would be minimised during the detailed design phase, including the maintenance of existing accesses where possible. Any access restrictions required for the CSELR proposal would be subject to further consultation between the affected parties, Transport for NSW and the appropriate local council (City of Sydney or Randwick City Council). A case by case consideration of each affected property access would be undertaken during detailed design (in consultation with the affected parties) to determine the access restrictions required along the proposed CSELR route.
A.9	Parking permit schemes would be considered, particularly in predominately residential precincts surrounding the CSELR corridor. These would be designed to afford priority to local residents to park in the vicinity of their home with an allowance for short-term parking for visitors and for vehicle access to commercial land uses and other short-stay trip generators.
A.10	Opportunities to stage construction works on the Anzac Parade and Alison Road corridors would be investigated during detailed design to provide additional capacity during construction and reduce increases to travel time.

ID No.	Environmental management measure – detailed design and pre-construction phase
A.11	Opportunities to signpost and promote alternative road corridors in the south-eastern suburbs of Sydney would be investigated during detailed design and/or construction phases with the aim of lowering traffic volumes along the proposed construction corridor.
A.12	Tidal flow operation on Anzac Parade during construction would be considered, to provide a bus priority lane in the peak direction and protect bus journey time reliability along the corridor during construction works. This would involve further review by RMS, including traffic modeling, to assess the impacts and feasibility in more detail. The final bus priority measures to be implemented would be determined in consultation with Randwick City Council and Roads and Maritime Services.
A.13	A single lane would be retained along the entire length of the existing Anzac Parade Busway and complementary bus priority measures on Alison Road. Potential mitigation measures would be developed to allow bus priority lanes in the peak direction during peak hours together with bus priority measures at the intersection of Anzac Parade and Alison Road. These priority measures would be explored as part of the Traffic Management Plans in consultation with the bus operators and the relevant Road Authority.
A.14	Opportunities to implement time-restricted loading zones on Holt Street, Waterloo Street and Riley Street would be investigated during detailed design, in consultation with the City of Sydney, to facilitate access to the adjacent retail and commercial businesses.
A.15	Opportunity to relocate the existing taxi rank from Anzac Parade (south of the Nine Ways intersection and adjacent to the South Sydney Junior Leagues Club) to the Wallace Street frontage of the South Sydney Juniors Club would be investigated during detailed design, in consultation with Randwick City Council.
A.16	To further reduce the extent of queuing on Belmore Road, the final design of the Belmore Road and Avoca Street intersection would be reviewed to determine if an additional short approach lane is required and can be incorporated on Belmore Road to manage traffic at this intersection.
A.17	The location north of the University of NSW where express buses would re-join the general traffic lanes along Anzac Parade would be determined during detailed design following further traffic and intersection modeling.
A.18	The Anzac Parade/High Street and the UNSW Mall/Anzac Parade traffic signals/crossings would be designed to ensure a light rail vehicle can be safely stored between each set of signals without blocking traffic entering and leaving the side roads.
A.19	The length and design of the right turn bay into Day Avenue from Anzac Parade would be investigated during detailed design.
A.20	All traffic and pedestrian modelling for the Light Rail design must be designed and tested against approved capacity of 55,000 patrons for the RRR and acknowledge the future UAP growth forecasts and confirm acceptable levels of service.

A.21	The proponent shall prepare a detailed **Transport Construction Management Plan** to identify how the project will be managed with regard to existing and future events at RRR. The Transport Construction Management Plan shall: a) Provide suitable design documentation and management plans to ensure that the RRR's Continuous Operating Environment (including equine and all raceday and non-raceday events requirements) will not be compromised for the duration of construction of the project and in the permanent completed operational state. b) Identify the impact during construction of proposed traffic and pedestrian management strategies to ensure the existing volumes of traffic, pedestrians and equine movements are catered for throughout the construction phase safely. c) Detail how major event pedestrian and vehicle activity will be safely and efficiently managed around the RRR Light Rail Stop construction zone and the balance of the Alison Road frontage. d) Identify the impact during construction on the Wansey Road and Stables Precinct during construction. e) Confirm the ATC is provided with ongoing access to the RRR at the current capacity at all times during construction. f) Confirm the configuration and replacement of existing capacity of access points on completion of the project. The Plan is to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works.
A.22	Any changes required to approved access points at the RRR shall be undertaken in agreement with the ATC prior to implementation to ensure there are no conflicts with the existing operations and continue to provide equivalent and satisfactory capacity. The final Plans identified above are to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works.
A.23	The proponent shall prepare a detailed **Traffic and Transport Management Plan** (TMP) to mitigate any impacts on the RRR. The TMP shall: 1. Be prepared in consultation with the ATC, RCC and UNSW. 2. Identify the impacts of Light Rail and how the site will operate during construction and on completion of the proposal. 3. Ensure that all intersections to the RRR cater for heavy and light vehicle traffic generated by all events and offer no less than the existing capacity of the RRR. 4. Ensure that all future designs cater for heavy vehicles crossing the Light Rail lines at all existing crossover points. 5. Ensure that all intersections where crossings are located into RRR be signalised and cater for all directional movements in and out of the RRR. The final Plans identified above are to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works.
A.24	The combined pedestrian and cycleway on Wansey Road should be located adjacent to the RRR.
A.25	**Impact on equine activities at RRR** 1. The proponent shall provide an **Equine Management Plan** prepared by a suitably qualified professional which sets out the construction and management procedures both during and after construction when dealing with horses. The Equine Management Plan shall: a. Include clear guidelines of construction and associated exclusion zones and project personnel education and induction processes to mitigate the risk of an event occurring that could result in damage or injury to a horse at the RRR. b. Address the equine considerations outlined in the ATC submission and any supplementary submission to the project. c. Identify a relocation strategy for the horses and trainers to be removed. d. Ensure all intersections and access points impacted by the project are relocated and designed to cater for the existing capacity requirements and sensitive to the specific requirements of equine transport vehicles. e. Address impacts relating to acoustics, light impacts, overshadowing and vibration and any other potential impact and propose suitable mitigation measures on all equine activities on the RRR site in conjunction with the **Acoustic Report and Noise Management Plan required under Condition B.13.** 2. The final Equine Management Plan is to be submitted to the Director General for approval in consultation with the ATC & Racing NSW prior to commencement of works.

A.26	**Event management and RRR** The proponent shall work with a suitable qualified consultant and the ATC to prepare a detailed **Event Management Plan** identifying the impacts of the Light Rail on the RRR during and after construction. The Plan shall ensure that the RRR will be able to maintain its service capacity and operations in place **prior** to the CSLER project. The Event Management Plan shall include: a. Documentary evidence of consultation and approval of the relevant state government agencies including NSW Police, Transport for NSW, Sydney Buses, RCC and the Roads and Maritime Service. b. Detailed modelling demonstrating that the design and management strategy provides for an equivalent (if not improved) capacity to cater for the potential of parallel events at the Sydney Cricket Ground, Moore and Centennial Park and RRR. This study should also contemplate UNSW requirements on such event days and the potential need to supplement the Light Rail with buses, if necessary. c. Demonstrate that all pedestrian flow paths are designed to cater for the approved 55,000 person capacity at RRR and demonstrate world's best practice in crowd control, access and egress and pedestrian safety. d. Ensure that pedestrian dwelling areas around traffic intersections and pedestrian road crossings are designed to cater for maximum crowd capacities. e. A detailed management strategy for the Spectator Precinct and surrounding major event pedestrian and traffic locations to identify the required manned management points and labour requirements. f. Demonstrate the mode split and capability for each mode to deal with the assumed capability in a best practice time frame. g. The proponent shall prepare a safety audit of the design by a suitably qualified professional with international experience ensuring compliance with worlds best practice standards. The Event Management Plan is to be submitted to the Director General for approval in consultation with the ATC prior to completion of works.
A.27	**Urban Activation Precinct** 1. The proponent shall provide additional information to the P&I in relation to the Urban Activation Precinct. This information should address the following: a. Detailed capacity modelling identifying the ability of the project to cater for the proposed UAP populations. b. Driveways and intersection design must be consistent with the locations identified in the UAP Structure Plan. c. The design, engineering and construction of the project must cater for the UAP Structure Plan including future basement structures, service provision through and under the Light Rail infrastructure and the ability to develop adjacent and over the Light Rail. The Plan is to be submitted to the Director General for approval in consultation with the ATC prior to completion of works.
A.28	**Light Rail interface with RRR boundaries** There should be no new battered retaining walls designed or constructed within the RRR. Alison Road, Wansey Road and High Street retaining walls and associated structures shall be designed to include penetrations at adequate intervals to cater for future service provision required by the RRR, including provision under racetracks.
A.29	**Randwick LRV Stabling Facility - Demolition of existing buildings and related infrastructure** 1. The Proponent shall ensure that all existing buildings, carparking, structures and infrastructure that requires demolition for the LRV Stabling Facility be reinstated on the RRR prior the proponent taking possession of the above.. 2. A full audit of all existing buildings and related infrastructure is to be prepared by a suitably qualified professional, including design of proposed solutions and submitted to the P&I in consultation with the ATC prior to demolition. 3. The existing security office and amenities must be reconstructed within the vicinity of the revised main entry gate location for surveillance purposes. Final plans are to be submitted to the Director General for approval in consultation with the ATC prior to commencement of any work.

A.30	**Randwick LRV Stabling Facility - Future replacement facilities and carpark** 1. The reconstruction of all buildings, carparking, structures and infrastructure must take place in a location of no lesser size, capacity and functionality of the current buildings and infrastructure and subject to the written agreement of the ATC. Any replacement facility and related infrastructure is to be approved and constructed prior to taking possession and demolition of the existing facilities to ensure that the functional capacity of RRR is maintained both during and post construction of the Stabling Facility. 2. The existing 745 car spaces currently used by the ATC to be removed by the Stabling Facility are to be replaced within the immediate vicinity of the existing parking area. The design and location of the replacement carpark shall be undertaken in consultation with the ATC located within the existing main Spectator Precinct driveway and taxiway. In order to reinstate all existing car spaces, a multi-level deck carpark facility or similar car parking structure may be required. 3. All design, approvals, construction and associated costs for the replacement facilities and carpark must be borne by the proponent's subject to the written agreement of the ATC. This condition is not intended to limit any claims that the property owner may have against the Proponent. 4. Final plans and reports identified above are to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works
A.31	The proposed new LRV stabling facility must be designed and fully constructed to be fully enclosed at all times.
A.32	**Randwick LRV Stabling Facility – Access and new Busway** 1. The proponent shall prepare amended plans and additional information to address the impacts of the Stabling Facility on the revised design of Gate 1 and the reconfiguration of gates 2, 5 and 18 to address reduced vehicle and pedestrian capacity at these gates. Final plans of reconfiguration of any gates shall be undertaken at the proponent's cost with the written approval of the ATC. This condition is not intended to limit any claims that the property owner may have against the Proponent. 2. The proponent will provide an appropriate high quality aesthetic treatment including wall and landscaping treatment within the LRV stabling boundary to adequately screen the RRR from the LRV stabling site and new busway. This includes the Alison Rd frontage: a. The reconfiguration of the intersection at Alison and Doncaster Roads to cater for buses and taxis exiting and new relocated Busway located adjacent to the Administration Building and be traffic light controlled as reconfigured by the ATC. b. The relocation proposed for buses servicing the racecourse in a configuration consistent with the existing ATC Busway with the same Alison Road frontage and on the southern side of the LRV tracks. c. Increase footpath dimensions on the southern side of Alison Road to best practice design to cater for maximum by capacity crowds and the conflict with cyclists. d. A dedicated pedestrian path along the southern side of Alison Road from the Doncaster Road to Wansey Road intersections shall be provided with any proposed cycle path located on the northern side of Alison Road. 3. Final plans and reports identified above are to be consistent with Plans prepared by Benson McCormack Architects Project No 1307A, Drawings 1204/A, 1205/A/B, 1206A/B/C, 1207/A/B Rev A and submitted to the Director General for approval in consultation with the ATC and NSW Police prior to commencement of works.
A.33	**Spectator Precinct and main entrance - impacts on existing RRR facilities and spaces** 1. The proponent must provide a new facility to replace the existing Swab building (to be demolished) with the agreement of the ATC. 2. The design of the proposed new Swab facility must be integrated into the event RRR Stop design including interpretive heritage features wherever possible or space to be included in the new Facility alternative / replacement interpretive features, proposed finishes and landscaping. 3. All design, approvals, construction and associated costs for the replacement facilities and associated infrastructure must be borne by proponent subject to the written agreement of the ATC and completed prior to the commencement of demolition and/or the proponent taking possession of the buildings, whichever comes first. This condition is not intended to limit any claims that the property owner may have against the Proponent.

A.34	**Spectator Precinct and Main Entrance - access to the RRR and Alison Road frontage** 1. The proposed access to the LRV Stabling facility shall be relocated to the Doncaster Road end of the site to lessen the conflict of uses at Gate 1. Details are to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works. 2. The J86-Energy Australia Kiosk shall be relocated underground within the Stables Precinct. Amended plans are to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works. 3. All existing Figs Trees located within the RRR frontages shall be retained or relocated as agreed with the ATC. 4. The proponent will provide all necessary easements and access rights to the ATC to allow access in perpetuity.
A.35	**RRR identification signage** The RRR entry sign will require re-design and re-location and be of no lesser size or quality. Amended plans shall be submitted to the Director General for approval in consultation with the ATC prior to commencement of works.
A.36	**Proposed Hotel Building** 1. The Alison Road, Darley Road intersection needs to be designed to cater for the ATC's proposed hotel development which is a State Significant Development. Amended plans are to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works. 2. The proponent shall provide any required easement required for the hotel which may encroach overhang over the public path by a minimum of a metre. Details are to be submitted to the P&I prior to issue of completion of works. 3. The proponent shall provide amended plans which amend the vertical design levels of the Light Rail Event Stop platform & associates ramps to be consistent with the proposed hotel design levels, and existing Spectator Precinct levels. Amended plans are to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works.
A.37	**Administration Building** The proponent must prepare the following additional information in relation to the Administration Building: 1. Specialist technical reports outlining the impacts and associated recommendations including design and specifications to mitigate any impacts during construction and operation. 2. A detailed pedestrian modelling report confirming the design is satisfactory for the maximum loads envisaged during major events along the whole length of the Spectator Precinct Alison Road frontage including signalised crossing locations on Alison Road. 3. A safety design report confirming the design complies with all applicable standards and best practices as well as requirements for relevant state agencies including the NSW Police Service. 4. Amended design indicating the proposed pedestrian and crowd control fencing including proposed secure zones during construction and operation using world best practice. 5. Any remedial works required to the Admin building will be at the proponent cost. Amended plans are to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works.
A.38	**Wansey Road - Approved Equine Stabling Facility** 1. The proponent must provide additional information to the P&I identifying any impacts of the Light Rail on the approved stabling facility including recommendations on appropriate mitigation measures. The report is to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works. 2. Any amendments to the approved design and associated approvals and costs must be managed and completed by the proponent prior to construction commencement of the Light Rail to ensure the revised Stabling Facility can be constructed. This condition is not intended to limit any claims that the property owner may have against the Proponent. 3. The proponent must demonstrate that the RRR has the existing capacity to access the stabling site for construction of the equine stabling facility during construction of the Light Rail.

A.39	**RRR Event Stop** The proponent must investigate further design options in consultation with the ATC and other relevant state agencies including TfNSW, RMS, Sydney Buses and the NSW Police. The investigations are to: 1. Establish the parameters of the station/stop and finalise the design detail and associated supporting documentation as to how the RRR Stop integrates with other modes of transport particularly in relation to major special event operations. 2. The approved 55,000 person capacity for the RRR must be maintained at all times. 3. Identify options to relocate the bus stop out of the Alison road corridor to improve safety of pedestrians and patrons, maximise pedestrian thoroughfare widths and minimise impacts on the capacity of Alison Road. 4. Use a qualified specialist consultant to confirm pedestrian and mode split safety 5. Confirm the re-location of lighting, CCTV, public address, ticket and turnstile gates, fencing and all other key pieces of infrastructure associated with the RRR Stop facility and reconcile against the existing arrangements. Further details including amended plans are to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works.
A.40	**Wansey Road and High Street Light Rail Stop** 1. Any buildings, structures, infrastructure and associated services to be removed and/or relocated are to be reconstructed prior to commencement of Light Rail works in this location. **1.** Should the proposed High Street Light Rail Stop not proceed and revert to the original location on Wansey Road, a new stabling facility to replace the number of stables and associated facilities will be completed prior to construction in the Wansey Road Precinct. All design, approvals by others, construction and associated costs for the replacement works must be borne by the proponent subject to the written agreement of the ATC. This condition is not intended to limit any claims that the property owner may have against the Proponent.
A.41	**Alison Road frontage heavy vehicle - intersection works** 1. Amended plans shall be submitted for a new intersection and race track crossing at Alison Road and Cowper Street that are substantially in accordance with the plans provided by the ATC to the proponent to cater for articulated heavy vehicles access to the infield. Final plans are to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works. 2. The proponent shall prepare amended plans for the proposed Cowper Street Intersection to provide alternative access to the infield for heavy and light vehicles during events and bump in and out times. Amended plans are to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works.

A.42	**Interface between Alison Road and RRR** 1. The proponent must carry out a dilapidation report by a specialist consultant and provide details of replacement of any buildings, service, infrastructure or any other item impacted by the project for approval by ATC & PRI 2. Amended plans must be submitted to the P&I identifying the proposed location and design of relocated racing or services infrastructure currently located within the zone between the existing RRR boundary and the race tracks. Amended plans are to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works. 3. Any replacement trees along the Alison Road frontage shall be mature trees of identical species in consultation with the ATC and RCC. 4. Any future fencing must ensure the security of the RRR and that: a. The width of the existing access/service road to the RRR is maintained. b. There is a satisfactory zone for planting landscaping on the racecourse side of any proposed fence. c. The fence is constructed from ground to a height that screens the view of Light Rail vehicles and catenaries from the track and provided satisfactory security for the RRR. d. Must meet acoustic performance requirements to ensure no impact on racing horses or jockeys. 5. There must be no affectation of the race tracks, ability for racing to be conducted and/or training or impacts on associated infrastructure at any time. 6. Any works undertaken in the vicinity of the racetrack shall ensure equine safety at all times, including noise, EMR and vibration during construction and operation of the light rail 7. All boundary treatments shall be high quality urban design outcomes in consultation with the ATC and RCC. 8. Any relocation of buildings, infrastructure or services and associated costs must be borne by the proponent. This condition is not intended to limit any claims that the property owner may have against the Proponent.
A.43	**Existing structures, infrastructure and services** 1. The proponent is to provide a Dilapidation Report prepared by an appropriately qualified professional assessing the impacts on all existing buildings, structures and infrastructure located within and/or associated with RRR (including the existing residence on the RRR) to determine any impacts including noise, vibration, access and residential amenity both during construction and operation and appropriate mitigation measures as agreed by the ATC. The Plan is to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works. 2. Any building, infrastructure or services requiring relocation as a result of Light Rail should be designed, approved and constructed at the proponent's cost. This condition is not intended to limit any claims that the property owner may have against the Proponent.
A.44	**Stakeholder Engagement Plan** The proponent shall prepare a **Stakeholder Engagement Plan** to ensure adequate consultation with all racing industry stakeholders regarding the impacts of construction, if required the relocation of stables and the renegotiation of any licenses and agreements. The Plan is to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works and must ensure regular updates.
A.45	**Access to RRR - Alison Road Frontage** All necessary rights to cross LRV tracks and use of access gates, laybacks, bus and vehicle infrastructure that service RRR that is no longer in ATC control will be provided for the life of the CSELR Project.
Noise and vibration	
B.1	The predicted noise and vibration levels in the EIS, and the determination of as-required noise and vibration mitigation, would be verified during the detailed design phase of the proposal. An Operational Noise and Vibration Review would be prepared to determine the final design of mitigation measures.
B.2	Where exceedances of 'other' (non-residential) sensitive receiver noise trigger levels have been predicted in the EIS (refer Table 14 in Technical Paper 11 (*Noise and Vibration Impact Assessment*)), this would be verified in the detailed design stage, including further investigation of whether these receivers have fixed glazing and do not rely on open windows for ventilation.

ID No.	Environmental management measure – detailed design and pre-construction phase
B.3	The final trackform design and associated operational ground-borne noise and vibration mitigation measures would be addressed in the detailed design of the track. Standard trackform would be employed through the majority of the George Street pedestrian zone and at other locations removed from particularly sensitive receptors. High-resilience trackform may be required to minimise ground-borne noise impacts at locations where sensitive receptors line the alignment. Very high attenuation track may be required at some locations, such as near the Randwick health precinct. Consultation with the receptors identified in Table 23 in Technical Paper 11 (*Noise and Vibration Impact Assessment*) of the EIS would be required during the detailed design phase to confirm the sensitivity of these locations to ground-borne operational noise. Investigations would establish the internal noise level achieved by these buildings at present, the location of sensitive spaces within each building and the level to which any theatres or recording studios are isolated. More detailed investigations would be conducted including measurement of existing internal and external noise and vibration levels, including ground-borne noise and vibration levels due to the existing road traffic and light and heavy rail in the CBD. These investigations would inform the required resilient trackform design in these locations and confirm the appropriateness of the ground-borne operational noise design goals.
B.4	Where potential exceedances of ground-borne operational vibration criteria have been identified in the EIS at locations with vibration sensitive equipment (refer to Chapters 12, 13, 15 and 16 of the EIS), ongoing consultation and collaboration with the owners and operators of vibration sensitive equipment along the proposed CSELR alignment would be undertaken throughout the detailed design stage to achieve appropriate vibration outcomes at the affected facilities.
B.5	Operational noise from new electrical substations would be controlled by inclusion of shielding or enclosures to comply with the NSW *Industrial Noise Policy* at all locations.
B.6	The detailed design of public address (PA) systems at light rail stops would include noise mitigation measures to minimise potential noise impacts at the nearest receptors to the stops to comply with the NSW *Industrial Noise Policy.*
B.7	During the detailed design stage, alternative noise mitigation options would be investigated for the Randwick stabling facility (refer measure AI.4 in Table 8.3) before determining the final solution to meet the NSW *Industrial Noise Policy* noise criteria.
B.8	The design of the maintenance building/workshop and mechanical equipment at the Rozelle maintenance depot would include noise mitigation measures (as required) to comply with the NSW *Industrial Noise Policy* criteria at the nearest noise sensitive receptors.
B.9	At the Rozelle maintenance depot, all audible alarm systems would be designed to be non-tonal and maintenance hard stand areas and turning spaces would be designed such that vehicles do not need to reverse unnecessarily. Alarm systems would be designed to meet the noise goals for the facility.
B.10	During the detailed design stage, construction ground-borne noise impacts would be revisited during preparation of the more detailed site-specific Construction Noise and Vibration Impact Statement for locations listed in Table 64 of Technical Paper 11 (*Noise and Vibration Impact Assessment*) of the EIS. This would include further assessment of the likely construction noise levels at the most affected recording rooms of all recording studios along the CSELR alignment and to establish receiver-specific noise goals, taking into account the type of recordings undertaken, and the existing external to internal noise insulation. Consultation with the owners/operators of these facilities would be undertaken as part of this process.
B.11	Additional assessment of construction road traffic noise impacts of night-time truck movements (if required) would be undertaken at detailed design stage when the finalised traffic plan is determined.
B.12	During detailed design, further assessment of the operational noise impacts on sensitive receivers would be undertaken in accordance with the NSW *Road Noise Policy*. This assessment would be limited to roads that result in increased traffic due to road closures or diversions directly as a result of the CSELR proposal.
B.13	The proponent shall provide a detailed **Acoustic Report and Noise Management Plan** prepared by a suitably qualified professional providing an acoustic analysis and mitigation measures for the RRR and surrounds. Final plans and reports are to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works. A report will be prepared on completion of the project to confirm compliance with acoustic performance criteria.

ID No.	Environmental management measure – detailed design and pre-construction phase
Visual and landscape	
C.1	Detailed design would consider opportunities for siting mature Fig trees within the Royal Randwick racecourse grounds in the vicinity of the intersection of Wansey Road and Alison Road, and in the Wansey Road nature strip (between Arthur and High streets) to recreate the canopy of the lost street trees on the western side of Wansey Road in consultation with the Australian Turf Club. TO BE AMENDED BY PROPOSED CONDITION A.34
C.2	Detailed design would consider the opportunity for a central pole catenary system to minimise visual impacts, in addition to consideration of opportunities to rationalise and/or group services, poles and wires to minimise visual clutter. The design of the overhead wiring system, including pole configuration would take into account, stakeholders views, operational requirements, best practice from other light rail systems, design and engineering constraints and environmental considerations.
C.3	Detailed design would consider opportunities to incorporate substations into other uses (such as ~~seating and~~ shade structures or built development), as well as opportunities to locate and/or design the substations to reduce their visual prominence and amenity impacts, in consultation with City of Sydney and Randwick City Council. Impacts would be minimised by: ▪ Identifying opportunities to locate substations below ground level would be investigated (where appropriate) during detailed design ▪ locating the substations away from sensitive receivers where possible (e.g. within existing buildings) ▪ planting appropriate vegetation ~~or~~ other screening such as appropriate cladding) around the above ground substations to minimise visual impacts for adjoining properties and/or parkland settings.
C.4	The Surry Hills stop would be designed to incorporate a new frontage to Devonshire Street for Ward Park to replace the existing landscaped seating area and new tree planting that would be removed by the CSELR proposal. More detailed concepts for this interface would be developed during detailed design in conjunction with the City of Sydney.
C.5	Detailed design would consider opportunities for incorporation of public art into treatment of the site hoarding and enclosure, in collaboration with relevant stakeholders.
C.6	The light rail tracks and paving near the Federation Place forecourt, located south of Lang Road, would be designed to integrate with the existing paving.
~~**C.7**~~	~~Design of UNSW Anzac Parade stop to maintain clear lines of sight from the University Mall.~~ **Note: This mitigation measure has been removed as this work has been completed. Refer to section 6.13 of the Submissions Report.**
~~**C.8**~~	~~Opportunities to minimise the impact on significant trees at UNSW would be further investigated during detailed design (e.g. rationalising the design of the UNSW Anzac Parade stop to move it away from the significant trees).~~ ~~Where trees are required to be removed, detailed design would investigate opportunities for siting semi mature Fig trees within the UNSW grounds (in the vicinity of the proposed CSELR stop) to recreate the perimeter planting along the Anzac Parade frontage and reinforce campus boundaries in consultation with the University of NSW.~~ **Note: This mitigation measure has been removed as this work has been completed. Refer to section 6.13 of the Submissions Report.**
C.9	Detailed design would consider urban design and public domain improvements for the alignment and areas that would be impacted by construction of the CSELR. This would include reinstatement of parks and open space, for example Wimbo Park and High Cross Park and the associated war memorial, as well as creation of new open spaces where available, including at Olivia Gardens.
C.10	Ongoing consultation with the City of Sydney, Randwick City Council, the Sydney Harbour Foreshore Authority and other relevant stakeholders would continue to be undertaken throughout the detailed design phase to identify opportunities for revitalisation of existing public spaces and the public domain and to determine the most appropriate form or revitalisation for these areas.

ID No.	Environmental management measure – detailed design and pre-construction phase
C.11	The detailed design of the Anzac Parade pedestrian bridge would be referred to the Urban Domain Reference Group for the CSELR proposal to ensure best practice urban design principles are applied.
C.12	The detailed design of the Eastern Distributor bridge would be referred to the Urban Domain Reference Group for the CSELR proposal to ensure to ensure best practice urban design principles are applied.
C.13	Appropriate architectural and urban design treatments would be undertaken to minimise the visual impact associated with noise mitigation structures for the proposed Randwick stabling facility and achieve an appropriate design outcome for this facility and local residents. The principles for development of the noise mitigation would include minimising overshadowing and maximising the retention of boundary trees to properties along Doncaster Road. The design process would include consultation with landowners. TO BE REPLACED/AMENDED BY PROPOSED CONDITION A32, A33, A34, B.13, C.14, C.15, D.18
C.14	**Landscaping and environmental impacts on RRR** The proponent shall provide a detailed ***Landscape Plan*** prepared by a suitably qualified professional in relation to the RRR that provides the following: a. details of proposed temporary construction fencing and permanent fencing and visual screening solutions at the boundaries of the RRR. b. All landscaping must be of high quality, in keeping with the materiality and landscaping of RRR and the surrounding area to ensure safety during all events and aesthetically satisfactory for representation of the area both to the Spectator Precinct patrons and the community. c. all external walls and surrounds of the Stabling Facility are appropriately landscaped and screened to interface and compliment the RRR, Centennial Parkland and surrounds Final plans are to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works.
C.15	**Shadow Impact and visual analysis for the LRV Stabling Facility** The proponent shall provide a detailed Shadow Impact and Visual Analysis of all proposed buildings and sutrctures prepared by a suitability qualified professional addressing any impacts from the LRV Stabling Facility on the ATC's adjoining buildings, racing infrastructure and landscaping. Final plans are to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works.
C.16	All electrical substations should be located underground, particularly on the Alison Road frontage surrounding the Spectator Precinct.
Built and non-indigenous heritage	
D.1	The detailed design of the proposed construction worksite n Circular Quay would minimise potential visual impacts on the setting of the Sydney Opera House. The construction compound would also be planned to retain significant elements of the park, including plantings, monuments and landscape features.
D.2	The detailed design of works in Regimental Square would aim to retain and conserve the memorial and associated significant plantings.
~~D.3~~	~~The design of the proposed above ground Parker Lane substation would be further investigated during detailed design with the aim of avoiding adverse impact on views of the lower section of the Palace Hotel from Parker Lane (which could include the consideration of a below ground substation option at this~~ location). **Note: This mitigation measure has been removed as this work has been completed. Refer to section 6.14 of the Submissions Report.**
D.4	The proposed shelter at the Rawson Place stop would be designed to minimise impacts on key views of the façade of Daking House and would be set back as far as possible from its awning. The regrading of the road and pavement levels would be detailed to avoid adverse impacts on the fabric of Daking House at ground level, and maintain the integrity of entry doors and shopfronts.
D.5	Detailed design of the Eddy Avenue alignment would retain and conserve the significant fabric of Central Railway Station and its underbridges.

D.6	Any fixings proposed to be attached to the underbridges of Central Railway Station would be to the concrete structure, not the sandstone.
~~D.7~~	~~Where feasible, service poles would be rationalised and services grouped to minimise clutter and minimise~~ impacts on surrounding visually sensitive receivers. **Note: This mitigation measure has been consolidated with mitigation measure C.2.**
D.8	The section of the CSELR alignment between Eddy Avenue and Chalmers Street would aim to minimise impacts on the Elizabeth Street Gardens.
D.9	The location and design of the Rawson Place stop would aim to minimise impact on key views of Central Railway Station east along Rawson Place.
D.10	The following measures would be implemented for the Randwick Precinct Heritage Conservation Area: ▪ ~~Where possible,~~ Detailed design of the CSELR alignment and the associated Royal Randwick racecourse stop would aim to retain (if possible) and avoid or minimise impacts on the significant built elements including the former racecourse gates and landscaping of the Racecourse Precinct Heritage Conservation Area. ▪ Detailed design of the light rail stabling facility in the north-western corner of the racecourse would investigate retention of remnant historic tram infrastructure to be integrated into the new stabling facility, where feasible. ▪ A photographic archival recording of the Alison Road and Wansey Road boundaries, the north-western area and the Swab Building would be undertaken prior to works commencing. Significant trees and structures to be demolished or altered would be recorded.
ID No.	**Environmental management measure – detailed design and pre-construction phase**
D.11	The detailed design of the CSELR would aim to retain as many as practicable of the significant trees along the route, where feasible without compromising rail safety, in particular at the Royal Randwick racecourse. TO BE AMENDED BY PROPOSED CONDITION A34
D.12	The following measures would be implemented for High Cross Park, including the High Cross Heritage Conservation Area and Significant Trees within High Cross Park: ▪ Detailed design of the proposed stop, ~~especially the large scale elevated canopy~~ the canopies, substation and associated infrastructure, would aim to minimise the land take in the reserve. The detailed design would aim to retain significant trees~~, where possible, and the war memorial~~. ▪ Where feasible, the proposed above ground substation would be changed to a below ground facility to reduce the extent of additional built infrastructure. ▪ Reinstatement of the remnant reserve landscaping. ▪ A photographic archival recording of the reserve would be undertaken prior to works commencing.
D.13	The following measures would be implemented for Tay Reserve: ▪ Detailed design of the CSELR proposal would minimise the area of Tay Reserve to be removed for the cross over at Anzac Parade. ▪ A photographic archival recording of Tay Reserve would be undertaken prior to works commencing.
D.14	~~The impact on the~~ The Rozelle maintenance depot would be designed to minimise impacts on the Historical Archaeological Management Units (HAMU) identified in Technical Paper 5 (Heritage Impact Assessment) in Volume 4 of the EIS. ~~would be revised during detailed design once more detailed information on the proposed Rozelle Maintenance Depot has been determined.~~
D.15	Further investigation of the design of the relocated Wansey Road stop would be undertaken during detailed design with the aim of reducing or avoiding impacts on Wansey Cottage and significant trees in the racecourse. TO BE REPLACED/AMENDED BY PROPOSED CONDITION A.38, A.40
D.16	The detailed design of the Anzac Parade pedestrian bridge would seek to retain the former bear pit in the grounds of the Sydney Boys High School, as well as minimise the number of significant trees to be removed along Anzac Parade. If the bear pit can be retained, it would be protected during construction works. The pedestrian bridge would be designed to provide an appropriate aesthetic design to minimise its impact on the setting of the Anzac Parade significant trees.

D.17	The significance of the former radio workshop at Central Station (refer to section 6.14 of the Submissions Report) would be assessed to determine the impact of the proposed substation location at Central Station, and to guide the detailed design of works to install the substation. If the existing radio workshop structure is found to be significant, the early/original form and fabric would be retained as far as practicable. Archival recording of the building would be undertaken prior to any works commencing.
D.18	Heritage interpretation measures should be in accordance with the Godden Mackey Logan Report and Heritage Strategic Management Plan. Any amendments are to be undertaken in consultation with the ATC.
Safety and security and hazard and risk	
E.1	Detailed design would incorporate the principles of Crime Prevention through Environmental Design (CPTED). This would include, but not be limited to, a full review and assessment in accordance with the CPTED principles of the each of the proposed stops and the proposed pedestrian bridge over Anzac Parade.
E.2	~~Targeted consultation with identified sensitive receivers for EMF (e.g. UNSW and Prince of Wales Hospital) would be undertaken to inform the detailed design. Any issues identified would be resolved on a case by case basis with solutions such as monitoring and, if necessary, protective screening at the site of the sensitive equipment.~~ Monitoring of electromagnetic fields (EMF) and electromagnetic interference (EMI) would be undertaken at both the UNSW and the Randwick Hospitals precinct prior to commencement of CSELR operations. The monitoring requirements for EMF would include: ▪ Establishing monitoring points pre-construction to create a baseline for existing EMI emissions. ▪ Designing a system that does not materially impact equipment operated by the UNSW and Randwick Hospitals precinct. ▪ Measuring EMI emissions during pre-revenue operations (commissioning) to ensure no material adverse effect. TO BE AMENDED BY PROPOSED CONDITION E.4

ID No.	Environmental management measure – detailed design and pre-construction phase
E.3	The detailed design for the proposed relocation of the Sydney Coach Terminal bays would include the provision of safe and suitable loading/unloading area(s) in addition to safe crossing from the coach stops to the pedestrian footpath on the southern side of Eddy Avenue. Pedestrian access to the proposed Eddy Avenue coach station island platform would be provided via the existing Eddy Square pedestrian crossing at the eastern end. A new crossing at the western end would be provided to allow pedestrian movement between the existing coach booking office and the coach platform.
E.4	**Electromagnetic field radiation (EMR)** 1. The proponent shall provide an EMR Assessment Report prepared by a suitably qualified professional. The Report shall include consideration of any potential impacts on: a. People, horses and/or Visual Display Units in the Administration and any other buildings located in a zone of influence (from Light Rail power sources). b. The proposed hotel development at the RRR. c. Approved horse stabling facility d. Any other areas where new power sources are in the vicinity of people and/or horses. e. Horses from operation of substations at High Street and Anzac Parade, the proposed Stabling Yard and the site boundary adjacent to Alison Road. The Plan is to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works. Further EMR report should be prepared on completion of the project to ensure compliance.
Regional land use and community outcomes and property acquisition	
F.1	Where property acquisition is required, it would be acquired in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991*. A Property Acquisition Plan would be prepared as part of detailed design.
F.2	Transport for NSW would consult with directly affected land owners during the detailed design of the CSELR proposal.
F.3	Transport for NSW would continue to liaise with users of the Moore Park facilities in relation to design and construction of the CSELR and potential impacts in relation to these facilities and their usage.
Hydrology, drainage and surface water quality	
G.1	For flood affected locations, the CSELR would be designed to ensure compliance with the *NSW Floodplain Development Manual* which includes a requirement to not increase flood levels above existing levels. Flood mitigation measures that could be considered include: ▪ increasing downstream drainage capacity ▪ diverting upstream flows around or under the track formation ▪ providing stormwater detention under or adjacent to the track formation. TO BE AMENDED BY PROPOSED CONDITION G.4
G.2	All additional flow diversions and new drainage would not exceed the capacity of the existing downstream drainage network and receiving environments. This would be achieved by a range of the following methods: ▪ diverting the existing drainage and crossing the track formation at a location that allows it at a point up slope of the alignment ▪ providing new drainage parallel to the CSELR alignment and crossing the track formation at a location that allows it at a point down slope of the alignment ▪ providing new drainage to discharge to an alternative outlet downstream without crossing the track formation ▪ recycling of wash-down water at the Rozelle maintenance depot and Randwick stabling facility. These measures would aim to prevent increased flood risk and hazard for property and infrastructure.
G.3	Operational protocols would be developed to address CSELR operation and passenger safety in the event of flooding occurring along the alignment.

G.4	**Flooding issues - RRR** 1. A detailed Flood Report prepared by a suitably qualified professional demonstrating that there are no detrimental flood impacts to any of the ATC's surrounding land resulting from the development. The Flood Study is to be submitted to the Director General for approval in consultation with the ATC and RCC prior to commencement of works. 2. Based on the mitigation measures identified in this Approval, the proponent shall prepare a final schedule of feasible and reasonable flood mitigation measures proposed at each directly-affected property in consultation with the property owner. The schedule shall be provided to the relevant property owner(s) prior to the implementation/ construction of the mitigation works, unless otherwise agreed by the Director-General. A copy of each schedule of flood mitigation measures shall be provided to the P&I and the relevant Council prior to the implementation/construction of the mitigation measures on the property. These works are excluded within the RRR site. Subject to agreement with the relevant property owner, any damage caused to property or infrastructure as a result of the Project shall be rectified or the property owner compensated, within a reasonable timeframe, with the costs borne by the Proponent. This condition is not intended to limit any claims that the property owner may have against the Proponent.
Groundwater	
H.1	Additional investigation/assessment of dewatering requirements for the construction of the Moore Park tunnel would be undertaken during detailed design and in consultation with the NSW Office of Water. Groundwater modeling would be undertaken to determine the potential impacts from the permanent interruption of groundwater flow, including the extent of the drawdown and the potential for settlement.
H.2	A dewatering system for excavations proposed in the Botany Sands aquifer would be developed. This could comprise the reinjection of groundwater back into the same aquifer to minimise the spatial extent of drawdown (and therefore settlement).
H.3	A field survey would be undertaken to confirm the existence, usage and condition of any bore located within the construction footprint of the CSELR proposal, or potentially affected by the CSELR proposal (e.g. those located in the vicinity of proposed excavations). This would cover an area appropriate to identify potential dewatering impacts.
H.4	The design of embankments would incorporate adequate drainage to reduce compaction and/or sealing of the underlying aquifer.

ID No.	Environmental management measure – detailed design and pre-construction phase
H.5	Adequate drainage and runoff management would be incorporated into the design of the Rozelle maintenance depot and the Randwick stabling facility. TO BE AMENDED BY PROPOSED CONDITION K.5
~~**H.6**~~	~~A condition assessment of existing buildings and infrastructure along and within the immediate vicinity of the Moore Park tunnel would be undertaken to monitor the risk of settlement from groundwater drawdown.~~ **Note: This mitigation measure has been consolidated with mitigation measure Y.2.**
Aboriginal heritage	
I.1	Information gathered from geotechnical investigations would be reviewed to further refine the areas of potential Aboriginal archaeological deposits identified in this EIS and the extent of impact on such deposits. This review would be undertaken for all areas of the CSELR corridor that have been designated as archaeological potential zones 1, 2 and 3.
I.2	A program of targeted test excavations would be undertaken for all areas of the CSELR corridor that have been designated as archaeological potential zones 1 and 2. This would follow on from the desktop review and site inspections of the CSELR proposal area which were completed for this EIS to assist in accurately determining areas of Aboriginal archaeological potential, and more accurately inform the impact assessment. This in turn would refine the nature and distribution of further mitigation measures, such as salvage excavation.
~~**I.3**~~	~~Where the allocation of archaeological potential zones is altered from those designated in this EIS, mitigation measures would be employed as relevant to the updated zoning.~~
I.4	Where required, local Aboriginal stakeholders would be involved and consulted with during Aboriginal archaeological works.
Greenhouse gas	
J.1	Transport for NSW would revise and update the greenhouse gas assessment undertaken for the CSELR proposal as part of this EIS during the detailed design phase. This would include the further identification of mitigation measures to reduce the volume of emissions generated during the construction and operational phases of the CSELR proposal. Evaluation and reporting on the feasibility of these mitigation measures would also be undertaken during detailed design as part of the greenhouse gas assessment.
J.2	Opportunities to reduce operational greenhouse gas emissions would be investigated during detailed design. These opportunities could include purchasing electricity derived from a renewable energy source (where available), the use of regenerative braking on rolling stock, promoting the selection of energy efficient rolling stock, the use of photovoltaic powered lighting at stops and undertaking a traction power assessment. The sustainability initiatives documented in Table 7.5 of the EIS (refer to Chapter 7 of the EIS) would be regularly reviewed, updated and implemented throughout the design development, construction and operational phases.
J.3	Undertake AS14064-2 (greenhouse gases – project level) compliant carbon footprinting exercise in accordance with Greenhouse Gas Inventory Guide for Construction Projects (Transport for NSW). The carbon footprint would be used to inform decision-making in design and construction. Use standard carbon coefficient values for construction material and fuel usage. Monitor and report the carbon footprint every six months during construction.
Utilities and services	
K.1	The proposed 12 substations for the CSELR proposal would be located so that they minimise amenity impacts along the CSELR alignment.
K.2	The extent of utility impacts and any works required to protect, relocate or replace services (including funding arrangements) would be confirmed during detailed design in consultation with the relevant utilities providers, including the City of Sydney and Randwick City Council. This consultation would also ensure that appropriate measures are taken regarding the potential integration of future utilities requirements along the alignment and to ensure that the CSELR proposal does not preclude the development or installation of these proposed utilities.

ID No.	Environmental management measure – detailed design and pre-construction phase
K.3	Should the location of any utilities be identified to be in conflict with the proposal, a review of the proposed works at these location(s) would be undertaken in consultation with the construction contractor. An alternative design or arrangements would then be determined to provide the most feasible and beneficial outcome for the community, service provider and proposal in terms of safety and constructability.
K.4	Consultation with services operators such as emergency services and other community services such as garbage collection services, would continue to be undertaken throughout the detailed design of the proposal in conjunction with the City of Sydney and Randwick City Councils.
K.5	**Utility Infrastructure including electrical stormwater and water** 1. The proponent must prepare a **Utility Relocation Strategy** for all power, sewer, communications, water and irrigation and any other impacted infrastructure for the RRR to ensure a continuous operating environment is maintained during construction and on completion as it was prior to the CSLER Project. 2. Should the proposed High Street Light Rail Stop be re-located back to the original location as detailed in the Environmental Impact Statement, a new water tank and stables (as per approval) are required to be constructed in a location acceptable to the ATC, with consideration of the existing distribution network and diversions or new pipework distribution. The Strategy is to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works. 3. All statutory approvals, design, construction and other associated costs will be borne by the proponent. This condition is not intended to limit any claims that the property owner may have against the Proponent.
K.6	**Air Quality** The proponent shall provide a Hazardous Materials Report prepared by a suitably qualified professional that includes procedures for construction, site remediation works and emission from the LRV stabling facility. The Report shall include an air quality assessment post construction. The Report is to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works. All statutory health and safety requirements are to be followed at all times to ensure the safety of ATC staff, RRR visitors, patrons and horses are protected at all times during and post construction. All approvals and associated costs to comply with the report will be at the proponent's expense.
K.7	**Essential Services, service infrastructure, utilities and flooding** The proponent shall undertake and maintain the following works in relation to essential utilities and services at the RRR as detailed below: 1. The proponent shall undertake a full audit of all existing services in consultation with the ATC 2. The proponent must ensure the ATC remains a continuous operating environment during any construction works. 3. Relocate all services, utilities and ATC service infrastructure, including all associated cabling infrastructure to a location satisfactory to the ATC. 4. All utilities and services within RRR in this location will need to be diverted and relocated to ensure full operational capacity of the RRR is maintained and no loss of existing system capacity during and on completion of construction. Subject to agreement with the relevant property owner, any damage caused to property or infrastructure as a result of the Project shall be rectified or the property owner compensated, including any required easements within a reasonable timeframe, with the costs borne by the Proponent. This condition is not intended to limit any claims that the property owner may have against the Proponent.
Sustainability	
L.1	The detailed design of the CSELR proposal would aim to achieve an 'excellent' rating under the Infrastructure Sustainability Council of Australia (ISCA) infrastructure rating tool. Table 7.5 in Chapter 7 of the EIS outlines initiatives applicable to achieve a rating level of 'excellent'.
L.2	Sustainable design and construction of the ~~project~~ CSELR proposal would be in accordance with the *Sustainable Design Guidelines V3.0* (Transport for NSW 2013d). Table 7.5 in Chapter 7 of the EIS (Volume 1A) outlines applicable initiatives to achieve a rating level of 'Gold'.

Climate change	
M.1	Climate change risk and opportunity assessments would be undertaken during detailed design and would include identification and mitigation of the key climate change risks for the proposal.
Planted trees	
N.1	Proposed construction methods would be reviewed to reduce the construction footprint, where feasible.
N.2	The large mature Figs adjacent to Alison Road, Wansey Road, ~~and~~ within the George Dan Reserve and within the proposed Randwick stabling facility would be reviewed by a suitably qualified arborist during detailed design to confirm if these trees could be retained and/or relocated. This review could include root zone mapping of potentially impacted Figs to determine the likely extent of their tree roots adjacent to and beneath the road surface (This would be undertaken in conjunction with the mitigation measure identified in mitigation measure C.1). Where feasible semi-mature Figs directly impacted by the construction of the CSELR proposal would be transplanted to an alternative suitable location, in consultation with Centennial Park and Moore Park Trust, ATC and Roads and Maritime Services (where Fig trees are proposed to be planted within the Anzac Parade road corridor). A detailed relocation and maintenance strategy for the impacted trees would be developed during detailed design, in consultation with Centennial Park and Moore Park Trust, Randwick City Council and the Australian Turf Club where required. TO BE AMENDED BY PROPOSED CONDITION A.34
N.3	Qualified arboricultural advice would be employed during detailed design and construction to confirm the expected impacts of the CSELR proposal on planted trees and to identify appropriate mitigation measures for such impacts. The advice would include root zone mapping of potentially impacted trees to determine the likely extent of their roots. This assessment would employ the most recent methods for assessing trees and impacts. The aim of this additional assessment would be to reduce the number of planted trees that would be impacted by the CSELR proposal.
Stakeholder engagement	
AN.1	Local business and community reference groups would be established and comprise independent representatives from the community to advise the proposal on community concerns related to the proposal. An Urban Domain Reference Group would be established to allow key partner stakeholders such as City of Sydney and Randwick City councils to review and comment on the proposed urban design elements. A Utilities Reference Group would also be established, which would comprise independent representatives from the utility owners to advise on utility concerns related to the proposal.

ID No.	Environmental management measure – construction phase
General environmental management measures	
O.1	Construction would be undertaken in accordance with Transport for NSW's ISO 14001 accredited environmental management system.
O.2	A construction environmental management plan (CEMP) would be prepared prior to construction, which would outline the construction conditions and temporary environmental protection measures to manage the impact of construction activities. The CEMP would be consistent with the environmental management measures documented in this EIS, conditions of approval and the conditions of any licences or permits issued by government authorities.
O.3	The CEMP would identify the auditing and inspection requirements and determine the framework for the management of key environmental issues for construction. To address site specific conditions, the CEMP would delegate particular management measures to be incorporated in discrete Environmental Control Maps.
O.4	The location of sensitive areas (e.g. heritage items and trees to be retained) would be clearly identified on Environmental Control Maps, which would be supplied to construction managers and workers.
O.5	All workers would be provided with an environmental induction prior to commencing work on-site. This induction would include information on the following: ▪ Environmental protection measures to be implemented to protect the quality of the surrounding environment, including weed control, erosion and sediment control, and water quality management and penalties for breaches. ▪ Noise and vibration management, including good working practices and measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable. ▪ Basic training in the recognition of Aboriginal cultural heritage material. This training would include information such as the importance of Aboriginal cultural heritage material and places to the Aboriginal and non-Aboriginal community, as well as the legal implications of removal, disturbance and damage to any Aboriginal cultural heritage material and sites.
O.6	A waste management plan would be prepared as part of the CEMP. Construction waste would be managed through the waste hierarchy established under the *Waste Avoidance and Recovery Act 2001*. All waste requiring off-site disposal would be classified in accordance with the OEH's (2009) *Waste Classification Guidelines* prior to disposal.
O.7	Procurement of materials would be undertaken on and 'as needed' basis to reduce over-ordering and wastage, and exploring opportunities to reuse materials, where applicable.
O.8	The CSELR proposal would aim to achieve a diversion rate for construction waste from landfill of 95 per cent of waste by volume, with a minimum target of 90 per cent of waste by volume. The proposal would also aim to reuse 100 per cent of paving and other reusable materials or facilitate reuse of such materials.
O.9	Opportunities to minimise the use of potable water would be investigated during construction planning. These opportunities could include the use of alternative water sources, such as recycled water and/or rainwater capture.
O.10	The CEMP would include measures to manage the potential impacts of construction compound operations. This would include inputs into the traffic management plan to minimise impacts associated with vehicle movements to and from construction compounds on surrounding receivers.
O.11	The following environmental management measures would be implemented for the Circular Quay

ID No.	Environmental management measure – construction phase
	construction compound: ▪ No trees within First Fleet Park would be removed by the proposed construction compound. Exclusion fencing would be established around the drip lines of each tree to minimise the risk of impact to the viability of the trees. Where impact to the drip line area cannot be avoided (due to space constraints), opportunities to raise construction facilities (e.g. demountable) above the ground level would be investigated so as to avoid impacting the underlying tree roots, in accordance with Australian Standard AS 4970. ▪ Only light structures such as site sheds and light loads would be used in this area to prevent damage to subsurface archaeology. Where appropriate, ground surface protection measures such as geotextile would be considered. The advice of an appropriately qualified archaeologist would be sought in relation to measures to protect subsurface archaeology. ▪ No excavation would be undertaken within First Fleet Park to minimise the risk of impacting on potential subsurface archaeology. ▪ Potential opportunity to temporarily remove plantings under the Cahill Expressway to facilitate construction vehicle access to the construction compound would be further investigated during detailed design, in consultation with relevant stakeholders. Any removed plantings would be reinstated at the completion of construction. ▪ Adequate measures would be implemented to minimise the visual amenity impact of the construction compound on the surrounding area. ▪ Adequate water quality controls would be implemented to reduce the risk of chemical spills/leaks reaching Sydney Harbour (due to the small offset distance to this waterway).
O.12	The following environmental management measures would be implemented for the Belmore Park construction compound: ▪ No trees within Belmore Park would be removed by the proposed construction compound. Exclusion fencing would be established around the drip lines of each tree to minimise the risk of impact to the viability of the trees. Where impact to the drip line area cannot be avoided (due to space constraints), opportunities to raise construction facilities (e.g. demountable buildings) above the ground level would be investigated so as to avoid impacting on underlying tree roots, in accordance with Australian Standard AS 4970. ▪ Pedestrian access through Belmore Park would be maintained for the duration of construction.
O.13	The following environmental management measures would be implemented for the Ward Park construction compound: ▪ The layout of the construction compound would be designed to minimise impacts to significant trees within Ward Park. Exclusion fencing would be established around the drip lines of each tree to be retained to minimise the risk of impact to the viability of the trees. Where impact to the drip line area cannot be avoided (due to space constraints), opportunities to raise construction facilities (e.g. demountable) above the ground level would be investigated so as to avoid impacting on underlying tree roots, in accordance with Australian Standard AS 4970. ▪ Vehicle access would be designed so as to avoid significantly impacting on trees that would not already be impacted by the proposed permanent works (e.g. light rail stop and substation).

ID No.	Environmental management measure – construction phase
O.14	The following environmental management measures would be implemented for the Wimbo Park construction compound: ▪ The proposed construction vehicle access to Wimbo Park would be designed to avoid impacts to significant street trees along Bourke Street that would not already be removed to accommodate the proposed permanent works (e.g. light rail track and associated overhead wires). ▪ Opportunity to provide construction vehicle access to Wimbo Park via South Dowling Street (rather than via an extension of Devonshire Street) would be investigated during detailed design, in consultation with Roads and Maritime Services. ▪ The construction compound boundary would be rationalised to allow for the early provision of alternative car parking provisions for the Langton Centre along the southern side of Nobbs Lane (to mitigate impacts associated with the acquisition of the Langton Centre car park). ▪ ~~The community mural would be preserved and relocated within the redesigned Wimbo Park, where feasible.~~ **Note: This mitigation measure has been partly consolidated with mitigation measure V.18.**
O.15	The following environmental management measures would be implemented for the associated construction facilities east and west of Anzac Parade (at Moore Park): ▪ The final layout of the construction compound would be configured so as to retain as many of the sporting fields as possible. ▪ The construction compound boundary would be ~~rationalised~~ designed to avoid impacts to significant trees within Moore Park that would not already be impacted by the proposed permanent works (i.e. the cut-and-cover tunnel). Exclusion fencing would be established around the drip lines of each tree to be retained to minimise the risk of impact to the viability of the trees. Where impact to the drip line area cannot be avoided (due to space constraints), opportunities to raise construction facilities (e.g. demountable) above the ground level would be investigated so as to avoid impacting on underlying tree roots, in accordance with Australian Standard AS 4970. ▪ ~~Where feasible, the Moore Park construction compound would be located to the north of the proposed cut-and-cover tunnel to minimise impacts to the bottom grounds (which are currently being used by the adjacent schools).~~
	▪ The Moore Park construction compound would not impact on the Korean War memorial or children's play area, located towards the north-western corner of Moore Park. ▪ A temporary footpath would be provided through Moore Park, to maintain current pedestrian access during the construction of the Moore Park tunnel. ▪ Exclusion fencing would be installed around the drip lines of any tree fringing the proposed staff car park (with the potential to be adversely impacted) to avoid impacts to the viability of these trees. ▪ Where feasible, staff car parking at the site would not be permitted during special events at Moore Park, to avoid impacting on special event parking at this venue.
O.16	The following environmental management measures would be implemented for the High Cross Park construction compound: ▪ The construction compound boundary would minimise impacts to significant trees within High Cross Park that would not already be impacted by the proposed permanent works (i.e. the Randwick stop). Exclusion fencing would be established around the drip lines of each tree to be retained (and with the potential to be adversely affected) to minimise the risk of impact to the viability of the trees. Where impact to the drip line area cannot be avoided (due to space constraints), opportunities to raise construction facilities (e.g. demountable) above the ground level would be investigated so as to avoid impacting on underlying tree roots, in accordance with Australian Standard AS 4970. ▪ Where possible, the construction compound at High Cross Park would be constrained to the northern portion of the park to maintain access to public open space and the war memorial. ▪ The High Cross Park construction compound would not impact on the war memorial. ▪ The opportunity to remove on-street parking on Belmore Road would be investigated during detailed design to reduce the extent of High Cross Park that would be required for the construction compound.

ID No.	Environmental management measure – construction phase
O.17	Opportunities to reduce the size of the construction compound required at High Cross Park would be investigated during the detailed design, including the ~~accommodation~~ option of a smaller satellite construction compound in the vicinity of the Wansey Road light rail stop. TO BE AMENDED BY PROPOSED CONDITION A.40
O.18	The Randwick stabling facility temporary construction compound would be configured so as to retain the large Moreton Bay Fig at the western end of the site, ~~where feasible~~. TO BE AMENDED BY PROPOSED CONDITION A.34
~~**O.19**~~	~~The following environmental management measures would be implemented for the UNSW construction compound:~~ ~~▪ The construction compound boundary would be rationalised to avoid impacts to significant trees within UNSW site that would not already be impacted by the proposed permanent works (i.e. the UNSW Anzac Parade stop). Exclusion fencing would be established around the drip lines of each tree to be retained (and with the potential to be adversely affected) to minimise the risk of impact to the viability of the trees. Where impact to the drip line area cannot be avoided (due to space constraints), opportunities to raise construction facilities (e.g. demountable) above the ground level would be investigated so as to avoid impacting on underlying tree roots, in accordance with AS 4970.~~ **Note: This mitigation measure is no longer required due to work that has been completed during the detailed design phase. Refer to section 6.13 of the Submissions Report.**
Stakeholder engagement	
P.1	A Community and Stakeholder Involvement Plan would be established prior to construction commencing. The Plan would identify: ▪ key stakeholders including each affected council ▪ methods to inform the community of the progress and performance of the proposal and issues of interest to the community ▪ processes to receive and manage complaints ▪ processes to consult with affected property owners, including property inspections, where appropriate ▪ protocols to notify stakeholders of relevant activities (e.g. out of hours work and traffic disruptions) and any incidents should they occur (e.g. unscheduled service interruptions). TO BE AMENDED BY PROPOSED CONDITION A.44
P.2	Newsletters and other communication tools (such as the Sydney Light Rail website) would be distributed to keep the community informed of construction progress, activities and impacts. This would ~~especially~~ outline the need to undertake out of hours works and the process for the community to register complaints and enquiries in relation to the works.
P.3	Complaints during construction would be managed in accordance with Transport for NSW's Community Engagement Policy. A 24 hour toll free complaints and enquiries number would be established for the duration of construction (1800 775 465).
P.4	Place managers would continue to function in each of the identified proposal precincts including the CBD, Surry Hills, Moore Park, Randwick and Kensington and Kingsford and Rozelle. Place managers would provide a single point of contact for all residents and businesses in the area.
P.5	One on one stakeholder briefings and community information sessions would be held when appropriate to support the rollout of the program of works. The Transport for NSW Community Information Centre would also continue to operate Monday to Friday 9.00 am to 5.00 pm.
P.6	Where the construction of the CSELR in the George Street pedestrian zone affects existing awnings, (including clearances below awnings, pavement levels or access to properties) affected property owners would be consulted. Should any construction works be required to modify awnings, these works would be undertaken, or costs would be met, by the CSELR construction contractor.

ID No.	Environmental management measure – construction phase
Traffic, transport and accessibility	
Q.1	A construction network management plan would be developed during detailed design to identify key management measures during construction to minimise impacts to journey times and congestion levels. The plan would also establish a framework for coordinating the implementation of such management measures during the construction of the CSELR proposal. The construction network management plan would seek to align the peak period travel demand with the traffic capacity available during construction. The construction network management plan would comprise a live document that would be updated as a greater understanding of the required construction staging is developed and as new management measures are identified in response to unforseen events during construction and light rail operations.
Q.2	Site specific traffic management plans would be prepared for the construction of the CSELR in accordance with RMS construction specifications and RMS *Traffic Control at Work Sites Manual Version 4.0*.
Q.3	The contractor would comply with the relevant roads authority procedures in applying for road occupancy licences.
Q.4	An application to the NSW Roads and Maritime Services would be made for any proposed adjustment to speed limits whether they are temporary (such as those required for short-term road occupancies), longer term (such as for the duration of a construction stage) or permanent. No adjustments to speed limits would be undertaken without an approved speed zone authorisation.
Q.5	The indicative planned traffic management measures described in section 3.9.4 of Technical Paper 2 (*Construction Traffic and Transport Management Plan*) of the EIS would be considered and, where appropriate, implemented to manage a reduction in traffic capacity along the CSELR corridor. The traffic, transport and access management strategies described in section 6.10 of the EIS would also be adopted during the construction of the CSELR proposal.
Q.6	Where possible, existing longitudinal pedestrian movements (i.e. pedestrian movements running parallel to the CSELR alignment) would be maintained along the footpaths. Similarly, where possible, transverse pedestrian movement (i.e. pedestrian movements crossing the CSELR alignment) would be maintained at existing pedestrian crossing facilities either at signals or controlled by traffic controllers. Clearly defined pedestrian paths and fencing would be provided to separate the pedestrian path from the worksite and prevent random crossings.
Q.7	Where appropriate, traffic controllers would be used when undertaking construction works adjacent to footpaths with high volumes of construction vehicle movements to manage the conflict between construction vehicles and pedestrians.
Q.8	*Disability Discrimination Act 1992* requirements would be adopted (e.g. with drop kerbs, etc. provided at crossings). Footpath widths would allow two-way pedestrian traffic, with sufficient space provided to accommodate pushchairs and wheelchairs. Where high numbers of vulnerable users utilise a footpath, special provision and design consideration would be undertaken to minimise impacts to these pedestrians.
Q.9	Consideration would be given in design to the layout of any hoarding/fence lines to maximise sight lines for pedestrians, and design out hiding places and blind spots to improve pedestrian personal security. Any gantry arrangements or tunnels would have internal lighting. Any hoardings, or other fixed site boundaries would have lighting if required by current standards.
Q.10	Consideration would be given to relocating or supplementing existing closed-circuit television (CCTV) cameras if the worksite creates unacceptable blind spots.
Q.11	Footway lighting would be provided, where required. Any barriers and pedestrian screens adjacent to pedestrian footways would be designed so as to permit observation from the worksite and opposite footway.

ID No.	Environmental management measure – construction phase
Q.12	Emergency evacuation requirements would be agreed with emergency service providers (Fire Brigade). Depending on the stage of work this may require: ▪ temporary road plates to permit crossing of the work zone ▪ assistance of traffic controllers in restricting public access to the street block and facilitating access for emergency service vehicles ▪ protocols for managing emergency response, which would need to be agreed with service providers prior to the start of work ▪ protocols to manage the evacuation of occupants adjacent to the worksite, which would need to be agreed with the building owners and service providers prior to the start of work.
Q.13	Where required, alternative cycle routes would be reviewed by the local authority with input from local bicycle user groups.
Q.14	Existing cycle paths located within the construction corridor but not occupied by the worksite would be maintained during construction, where feasible.
Q.15	Access for emergency vehicles would be maintained at all construction-sites and emergency services would be advised of all planned changes to traffic arrangements prior to applying the changes.
Q.16	During project inductions, all heavy vehicle drivers would be provided with the emergency response plan for construction traffic incidents. An emergency response plan would also be developed for construction traffic incidents and provided to drivers as part of the induction. In the event of an emergency occurring during the construction of the CSELR proposal, Roads and Maritime Service's *Incident Response Plan Manual* would be consulted to determine the appropriate procedure and responses required to address the emergency.
Q.17	Heavy vehicles would be restricted to specified routes, with the aim of avoiding local streets, high pedestrian areas and school zones. Where feasible, route markers would be installed for heavy vehicles along designated routes.
Q.18	Off-site construction vehicle parking would be limited to designated areas. Areas of temporary on-street parking during peak construction events would be identified in the traffic management plans to minimise the impact on surrounding properties and businesses.
Q.19	The queuing and idling of construction vehicles in residential streets would be minimised.
Q.20	A pre and post construction assessment of road pavement assets would be conducted in areas likely to be used by heavy construction vehicles.
Q.21	Public communications would advise the community and local residents of vehicle movements and anticipated effects on the local road network relating to site works in accordance with the CEMP. Affected stakeholders, such as local government authorities, emergency services, utility providers, local schools, public transport operators, public transport users, road users, local businesses, local employees and residents, would receive advance notification of scheduled construction works to allow for planning of required journeys.
Q.22	Construction vehicle traffic movements would be undertaken outside of peak road traffic periods and outside of school peak periods where feasible.
Q.23	Appropriate information, road and traffic signage, pavement markings and line markings would be implemented to advise commuters, pedestrians and road users of changed conditions.
Q.24	The end state transport arrangements for the City Centre Precinct (e.g. traffic environment during the operational phase of the ~~project~~ CSELR proposal, as described in section 12.3.3 of the EIS) would be implemented prior to construction, where appropriate and compatible with construction requirements. This could include the diversion of bus services in accordance with the Sydney City Centre Access Strategy, closure of minor side road junctions and laneways (where access is proposed to be permanently removed), and enhancements to the east-west capacity of cross streets within the CBD (where possible).
Q.25	Intersection works within the City Centre Precinct would be undertaken on weekends and at night during weekdays.

ID No.	Environmental management measure – construction phase
Q.26	Works at major intersections within the City Centre Precinct would be staged to maintain key traffic movements (e.g. Grosvenor Street/Bridge Street and Pitt Street/Eddy Avenue). Works at other intersections would be undertaken during weekend and weekday night intersection closures, with traffic diverted to alternative routes. The closure of these intersections would be conditional on the alternate route remaining open (e.g. Hunter Street westbound would remain open while Bridge Street westbound is closed).
Q.27	Major disruptive works would be scheduled to occur during times of lower traffic movement (e.g. during the Christmas/New Year period). Measures required to manage pedestrian movements during such works would be reviewed to determine their adequacy in coping with increased pedestrian activity during the public holiday period.
Q.28	Property access within the City Centre Precinct would be maintained, based on the following hierarchy (corresponding to the current frequency of use) and subject to agreement with the affected property owners and business operators: ▪ properties with infrequent access requirements would be managed through the use of traffic controllers on an ad hoc basis and/or the scheduling of deliveries to occur outside of work hours ▪ access to properties with frequent deliveries (e.g. the Westfield loading dock) would be maintained via an access track ▪ where feasible, a lane would be retained for 24 hour property access. Where this is not feasible, a 24-hour traffic controller would manage property access.
Q.29	The local road network changes outlined in Table 12.17 of the EIS would be implemented to manage impacts to traffic.
Q.30	The coordination of construction activities at redevelopment sites without access to alternate street frontages to George Street would also need to be negotiated with the building owners and contractors prior to the start of work.
Q.31	Local bus diversions outlined in Table 12.19 of the EIS would be implemented to manage the CSELR proposal's impact on bus operations at Chalmers Street, Eddy Avenue, Rawson Place, and the Park Street/Druitt Street/George Street intersection. An assessment of bus stop capacity would be undertaken for those stops located on high-activity corridors to confirm that they do not exceed capacity during construction.
Q.32	Access to the key heavy rail interchange hubs of Wynyard, Town Hall and Central would be retained, with existing controlled crossing points through worksites being maintained.
Q.33	Traffic signal operation would be reviewed to identify turning movement conflicts with pedestrians crossing at intersections and vehicles on access lanes and accessing worksites.
Q.34	The number of traffic changes would be minimised (where possible) to maintain the legibility of the network for the public, businesses and emergency services to simplify network operations.
Q.35	Access corridors for emergency services would be maintained along the George Street worksite. Pull-off areas (between gaps in barriers) would be provided to allow construction vehicles to stand clear of the access lane. Where this is not feasible and delivery requirements dictate vehicles to stand for an extended time (e.g. while unloading track sections) these deliveries would be made outside business hours. Through traffic would be discouraged by public education, signs, traffic controllers and enforcement.
Q.36	The Elizabeth Street, Crown Street and Bourke Street intersections with Devonshire Street would remain open to traffic for the duration of construction. Construction works at these intersections would be staged to allow traffic to pass adjacent to the worksites and thus ensure property and network accessibility is maintained.
Q.37	Construction across South Dowling Street and the Eastern Distributor would be undertaken as staged night works and night works with some road closures.
Q.38	Vehicles access to all adjacent properties would be maintained during the closure of Devonshire Street. Waterloo Street and Riley Street would remain open during the closure of Devonshire Street. Traffic controllers would be used to guide private vehicles between their driveway and Waterloo Street when works are undertaken adjacent to Waterloo Street.

ID No.	Environmental management measure – construction phase
Q.39	Where feasible, all construction vehicles would be contained within the Ward Park worksite, while staff would utilise potential parking facilities located within designated construction compounds at Moore Park and the proposed Randwick stabling facility.
Q.40	Existing pedestrian footpaths along Devonshire Street would be retained and protected from the worksite with barrier protection, with the exception of during works undertaken adjacent to Ward Park, where pedestrians may need to be diverted to the northern footpath.
Q.41	During intersection staging works, pedestrian crossing facilities would be maintained either by providing an alternate crossing opportunity adjacent to the work zone or maintaining the existing pedestrian facilities.
Q.42	During construction, the reconfiguration of Randle Street would allow for two-way cycle movements, providing a connection from Cooper Street through to Prince Alfred Park (inner south) and Belmore Park (southern CBD).
Q.43	Construction of the CSELR proposal across Lang Road would be undertaken during night works over an approximate two week period. The proposed construction activities would avoid periods when major events are scheduled within Moore Park. Construction of the CSELR proposal across Lang Road would be undertaken during complete closure of the Anzac Parade/Lang Road intersection with traffic directed to the alternate access point of Driver Avenue and Moore Park Road, as shown in Figure 14.4 of the EIS.
Q.44	The proposed construction compound, bentonite plants and laydown facility proposed within the Moore Park Precinct would be positioned so as to minimise the effect on land use and parking provisions during special events, as negotiated with the Centennial Park and Moore Park Trust.
Q.45	Construction activities and traffic movements to and from the staff car park at the Moore Park construction compound would be minimised during major events to ensure that there is minimal construction traffic within the local area, to minimise the impact on the road network and in particular the localised congestion within the Moore Park Precinct.
Q.46	To ensure safety of the workers on-site, separation barriers would be installed along the borders of the worksites in the vicinity of the off-road busway, in locations where there is high speed traffic on adjacent lanes.
Q.47	Construction at the southern Gregory Avenue intersection with the busway would be undertaken in a staged manner to facilitate one directional bus movements at this location at all times, as far as practicable.
Q.48	An alternate path would be provided for pedestrians and cyclists at the location where the proposed CSELR route crosses over the existing shared pedestrian and cycle path located adjacent to the busway within Moore Park. This alternate path would be provided within the same segment of the intersection and would not require crossing of Anzac Parade or Alison Road.
Q.49	During intersection works at Lang Road, all existing pedestrian and bicycle crossing facilities would be maintained either by providing an alternate crossing opportunity adjacent to the work zone or maintaining the existing pedestrian facilities.
Q.50	A single traffic lane would be maintained in each direction along High Street within the Randwick Precinct at all times.
Q.51	The construction of the CSELR across Alison Road in the Randwick Precinct would be undertaken in stages to maintain a minimum of two lanes of travel in each direction during each works stage. A minimum of two traffic lanes would be retained along Anzac Parade in each direction within the Kensington/Kingsford Precinct. Where achievable, an additional city-bound lane would be provided which would operate as a peak period bus only lane and off-peak parking zone.
Q.52	Construction works at the Alison Road/Doncaster Avenue intersection would be staged, with works scheduled to occur during weekends when no major events are planned at Royal Randwick racecourse. TO BE AMENDED BY PROPOSED CONDITION A.21
Q.53	Works at the intersections of High Street with Wansey Road and Botany Street would be undertaken in stages during off-peak periods (i.e. either during weeknights and/or weekends). TO BE AMENDED BY PROPOSED CONDITION A.21
Q.54	The Belmore Road intersection works within the Randwick precinct would be staged during the weekend and nights.

ID No.	Environmental management measure – construction phase
Q.55	Where possible, only on-street parking spaces that would be permanently removed to accommodate the CSELR proposal would be impacted during the construction phase (other than those spaces required for construction compounds).
Q.56	Bus priority measures would be explored during detailed design at the intersection of Anzac Parade and Alison Road.
Q.57	A permanent bus diversion would be established for the bus routes 357, 400 and 410 via Blenheim Street, as shown in Figure 15.8 of the EIS. As part of this diversion, the affected High Street bus stops would be relocated to Clara Street (north of Blenheim Street), consistent with the changes proposed as part of the operational phase of the CSELR proposal. The existing taxi zone on High Street (outside of Prince of Wales Hospital) would be relocated to Clara Street, opposite the existing taxi zone (and adjacent to the bus stops), in consultation with Randwick City Council.
Q.58	Temporary passenger set-down and pick-up areas for special event buses and coaches accessing Royal Randwick racecourse would be established along Darley Road, adjacent to the TAFE Randwick campus, as shown in Figure 15.10 of the EIS, or nearby as feasible. TO BE AMENDED BY PROPOSED CONDITION A.21, A.26, A.32
~~Q.69~~ **Q.59**	During events scheduled at Royal Randwick Racecourse, construction activities adjacent to the main entrance to the racecourse on Alison Road would be reviewed so as to not significantly impact on the roundabout operation at the intersection of Ascot Street and Doncaster Avenue, and to maintain safe pedestrian access across the worksite. TO BE AMENDED BY PROPOSED CONDITION A.21, A.23, A.26, A.32
Q.60	The proposed signalisation of the Wansey Road/Alison Road intersection would be implemented as part of the early works so that pedestrians can safely cross Alison Road during the construction phase. TO BE AMENDED BY PROPOSED CONDITION A.21, A.23
Q.61	During construction, to reduce any conflict between the bus operations associated with the bus stops outside the UNSW, adjacent to Gate 9, and construction activities, a westbound bus stop would be provided west of Wansey Road, as shown in Figure 15.9 of the EIS, as required. TO BE AMENDED BY PROPOSED CONDITION A.21, A.23
Q.62	The existing bus stops located adjacent to Central Railway Station that currently service the university express services would remain operational throughout the construction phase.
Q.63	Alternate on-road cycle routes would be signposted during the construction phase to maintain suitable cycle access to UNSW and the southern Randwick Precinct. Existing Randwick City Council on-road cycle routes would be encouraged through signposting and line marking. Furthermore, directional signs would be installed at key locations to direct cyclists to the cycle route. TO BE AMENDED BY PROPOSED CONDITION A.21, A.23
Q.64	Pedestrian crossing opportunities would be maintained during intersection works at Botany Street and Belmore Road either by maintaining the existing pedestrian facilities or providing alternate crossing opportunities at adjacent locations.

ID No.	Environmental management measure – construction phase
~~Q.65~~	~~A minimum of two lanes of traffic would be maintained along Anzac Parade (within the Kensington/Kingsford Precinct) in both directions during the day time.~~ **Note: This mitigation measure has been consolidated with mitigation measure Q.51.**
Q.66	CSELR construction works at the Alison Road/Anzac Parade intersection and within the wider Kensington/ Kingsford Precinct would be undertaken during week nights and weekends to minimise the impact on adjacent properties and the road network.
Q.67	Construction works at locations with proposed light rail stops in the Kensington/Kingsford Precinct would be undertaken during staged night and weekend works (where required) with traffic controls. Traffic controls would be removed before the morning peak.
Q.68	The closure of the median gaps at Abbotford Street, Carlton Street and Ascot Street in the Kensington/ Kingsford Precinct would be implemented during the construction phase.
Q.69	Multiple construction activities occurring concurrently at multiple sites along Anzac Parade would be managed so that accesses to adjacent properties are maintained.
Q.70	The High Street intersection works in the Kensington/Kingsford Precinct would be staged during the weekend and nights. Construction activities at the intersection would be avoided, wherever possible, during special events at the racecourse or the university during the weekends. The staging of the High Street intersection would maintain all existing movements at the intersection; however, the existing dual right turn from High Street would need to be restricted to a single lane during these weekend closures.
Q.71	The right-turn movement from Anzac Parade south to Rainbow Street would be permanently banned at the commencement of construction. Right turn movements would be accommodated at the downstream intersection at Barker Street or earlier upstream at adjoining roads and accessing Avoca Street.
Q.72	Overhead wiring works and changeovers between the intersection layouts at the Nine Ways intersection (to facilitate installation of signals, line marking, removal of kerb blisters and paving) would be undertaken during nightshifts and weekends to minimise the impact on traffic.
Q.73	End-state (i.e. during the operation of the CSELR proposal) right-turn opportunities along Anzac Parade intersections would be maintained wherever possible. Where such opportunities cannot be maintained during construction, alternative access routes would be provided, in conjunction with Roads and Maritime Services, to ensure sufficient capacity is maintained.
Q.74	Construction activities at Todman Avenue and Doncaster Avenue would be undertaken at separate times to minimise impacts to access.
Q.75	Intersection works at Strachan/Middle Streets and Borrodale/Meeks Streets in the Kensington/Kingsford Precinct would not coincide with works at Barker Street to minimise impacts to access.
Q.76	During construction, suitable alternative parking for the Langton Centre would be provided within the general vicinity of the Langton Centre. Access to this facility would be maintained at all times.
Property and land use	
R.1	Consultation would be undertaken with agencies such as the City of Sydney, utilities providers and other potential stakeholders (such as stakeholders associated with future developments within the vicinity of the CSELR proposal) throughout construction of the proposal to identify measures to minimise potential conflicts, potential land use impacts to community facilities such as Ward Park and Wimbo Park and opportunities for minimising impacts to existing land uses.
R.2	Consultation would be undertaken with the Centennial and Moore Park Trust as the key land holder for a majority of the land uses impacted by the CSELR proposal within the Moore Park Precinct.
R.3	For the Randwick precinct, consultation would be undertaken with agencies such as Randwick City Council, utilities providers and other potential stakeholders such as the UNSW, the ATC and the Prince of Wales Hospital throughout construction of the proposal to minimise ongoing impacts to existing land uses. TO BE AMENDED BY PROPOSED CONDITION A.21, A.23, A.44

ID No.	Environmental management measure – construction phase
Noise and vibration	
S.1	A Construction Noise and Vibration Management Plan (CNVMP) would be developed to document all necessary measures to manage and mitigate potential noise and vibration levels during standard daytime and out of hours construction activities. In general this would include some or all of the following measures: ▪ For construction concentrated in a single area, such as at the stops, worksites, substation construction-sites, bridge sites and stabling / maintenance facility locations, temporary acoustic fencing/barriers around the site perimeter ~~should~~ would be considered where feasible and reasonable to mitigate off-site noise levels. ▪ Given the potentially high noise levels at residential receptors, adherence to daytime construction hours is recommended for excavation, demolition or rock breaking activities, and for activities concentrated in a single area (i.e. activities that do not move along the alignment, and do not require out of hours activities for safety reasons or to minimise disruption to road networks). ▪ Noise generating night works should be programmed to minimise the number of consecutive nights work impacting the same receptors. ▪ Consultation would be undertaken with nearby local schools prior to noise intensive works to ensure impacts are minimised during examination periods and/or other critical periods in the school calendar (where works are predicted to exceed the relevant construction noise management level for this receiver). Consultation with nearby childcare centres to be undertaken to potentially avoid noisy works during rest periods at the centres. ▪ Where feasible, simultaneous operation of noisy plant in close proximity to sensitive receptors would be avoided. ▪ Equipment which is used intermittently is to be shut down when not in use. ▪ Where possible, the offset distance between noisy plant items and nearby noise sensitive receptors should be as great as possible. ▪ Where possible, equipment with directional noise emissions should be oriented away from sensitive receptors. ▪ Regular compliance checks on the noise emissions of plant and machinery regularly used to determine whether such plant comply with predicted noise emissions or are higher than predicted. Compliance checks would also be used to identify defective silencing equipment on the items of plant. ▪ Ongoing noise monitoring during construction at sensitive receptors during critical periods to identify and assist in managing high risk noise events. ▪ Reversing of equipment should be minimised so as to prevent nuisance caused by reversing alarms. ▪ Loading and unloading should be carried out away from sensitive receptors, where practicable. ▪ Work should be scheduled to provide respite periods from the noisiest activities, and impacted residents should be communicated with to clearly explain the duration and noise levels for the works. ▪ Where all feasible and reasonable practices have been applied and noise would be more than 5 dB above the noise affected level, the proponent should negotiate with the community to determine the schedule for the works or provide respite to occupants where sleep disturbance is likely to occur.
S.2	Wherever reasonable and feasible, construction work on the proposal would be undertaken in the recommended standard hours for construction work: ▪ Monday to Friday 7.00 am to 6.00 pm ▪ Saturday 8.00 am to 1.00 pm ▪ No work on Sundays or public holidays.

ID No.	Environmental management measure – construction phase
S.3	Site specific CNVMPs would be developed. These would provide a detailed assessment of potential noise levels and site specific measures to control potential noise impacts and minimise the potential for disturbance at affected receptors. A range of feasible and reasonable construction noise mitigation measures would be provided. Within the Randwick Precinct, the CNVMP would include communication with the owners of the horse stables near the proposed works to clearly explain the timing, duration and likely noise levels for the works.
S.4	In the event of predicted exceedances of the noise goals (particularly during out of hours works), additional noise mitigation measures in the Transport for NSW *Construction Noise Strategy* would be included in the CNVMPs where reasonable and feasible. As noted in section 12.5.1 of this EIS, the option of alternative accommodation during highly intrusive noise impacts at night-time is unlikely to be reasonable and feasible in the City Centre Precinct. For other precincts, offers of alternative accommodation would only be considered in the event that more than two consecutive nights of highly intrusive noise works are required in any particular location.
S.5	For sensitive receptors that operate outside standard construction hours, for example hospitals which operate on a 24 hour basis, reasonable and feasible noise mitigation options and measures would be developed in consultation with the receptor.
S.6	During construction, attended measurements would be undertaken at the commencement of rockbreaking activities in the vicinity of the premises listed in Table 64 of Technical Paper 11 (*Noise and Vibration Impact Assessment*) of the EIS, to assist in evaluating and managing construction ground-borne noise impacts in conjunction with the premises operators. Alternative construction methods such as smaller rockbreakers, rock saws or respite periods would be considered if required to minimise noise impacts. In the event that lower impact equipment cannot be substituted, all efforts would be made to reschedule work to less sensitive times in consultation with affected communities.
S.7	Where vibration intensive construction activities are proposed within 100 metres of sensitive receptors, these works would be confined to the less sensitive daytime period where possible. The potential impacts from vibration are to be considered in the site-specific CNVMPs. In general, mitigation measures that would be considered include: ▪ Relocate vibration generating plant and equipment to areas within the site in order to lower the vibration impacts. ▪ Investigate the feasibility of rescheduling the hours of operation of major vibration generating plant and equipment. ▪ Use lower vibration generating items of excavation plant and equipment (e.g. smaller capacity rockbreaker hammers). ▪ Minimise consecutive works in the same locality (if applicable). ▪ Use dampened rockbreakers and/or ‘city’ rockbreakers to minimise the impacts associated with rockbreaking works. ▪ If vibration intensive works are required within the safe working distances, vibration monitoring or attended vibration trials would be undertaken to ensure that levels remain below the cosmetic damage criterion. ▪ Building condition surveys would be completed both before and after the works to identify existing damage and any damage due to the works. ▪ Measurements of existing ambient vibration levels would be undertaken at receptors with vibration sensitive equipment during the detailed design phase. This information would be used to inform the site-specific CNVMPs for works near these locations.

ID No.	Environmental management measure – construction phase
Planted trees	
T.1	Trees that would not be directly impacted by the proposed CSELR permanent works (e.g. overhead wires, substations, light rail stops, kerb realignments, service relocations, etc.) — or significantly impinge on required clearances to such infrastructure, such that the tree would need to be removed to allow for the safe operation of the CSELR — would be retained. All trees to be retained would be protected prior to the commencement of construction in accordance with AS4970 the Australian Standard for *Protection of Trees on Development Sites and Adjoining Properties*. Some trees would require one-off or ongoing maintenance, for example pruning of low branches that would interfere with the overhead wiring. Where pruning of trees is required, a qualified arborist would be engaged to assess the health and condition of the tree and to plan and undertake any pruning works.
T.2	Exclusion fencing would be established around the drip lines of each tree to be retained to minimise the risk of impact to the viability of the trees. Where impact to the drip line area cannot be avoided (due to space constraints), opportunities to raise construction facilities (e.g. demountable) above the ground level would be investigated so as to avoid impacting on the underlying tree roots, in accordance with Australian Standard AS 4970 Protection of Trees on Development Sites.
T.3	Where the loss of trees is unable to be mitigated, trees removed as a result of the CSELR would be offset in accordance with the Transport for NSW *Vegetation Offset Guide* (~~TfNSW~~ Transport for NSW 2013a), which includes a principle of replacing 'the amenity/visual landscape value of vegetation removed' even if the vegetation may not have significant ecological value. Replacement plantings would be agreed in accordance with the CSELR Landscape Strategy (Appendix F of the EIS) and consultation with relevant stakeholders. Replacement plantings would be maintained by the Operator (or as otherwise agreed with any relevant stakeholders) for a period no greater than two years. TO BE AMENDED BY PROPOSED CONDITION A.34, C.14
T.4	Construction techniques that minimise impacts to tree root zones would be employed where practicable. This would include consideration of compaction and root bridging techniques, permeable paving, tunnel boring of services, hydro-excavation and careful root pruning). The use of low impact construction techniques (on existing tree roots) for installation of new services would also be considered, where appropriate and feasible.
T.5	The trees in Martin Place would not be impacted during the construction of the CSELR proposal. Design and siting of the underground substation in Martin Place would be undertaken so as to provide adequate clearance of the structure from the root zone of these trees. Exclusion fencing would be erected around these trees during construction.
T.6	Opportunities to translocate the four mature trees on Rawson Place to a suitable new location would be investigated during detailed design, where feasible. *Lophostemon confertus* (Brush Box) trees are also proposed in Rawson Place as part of landscaping.
T.7	~~Where feasible semi-mature Figs directly impacted by the construction of the CSELR proposal would be transplanted to an alternative suitable location, in consultation with Moore and Centennial Parks Trust and Roads and Maritime Services (where Fig trees are proposed to be planted within the Anzac Parade road corridor). A detailed relocation and maintenance strategy for the impacted trees would be developed during detailed design, in consultation with Moore and Centennial Parks Trust, Randwick City Council and the Australian Turf Club where required.~~ Fig species (consistent with existing plantings) and *Lophostemon confertus* (Brush Box) would generally be used along Anzac Parade as replacement trees. **Note: This mitigation measure has been partly consolidated with mitigation measure N.2.**
T.8	Potential impacts to the large mature Figs adjacent to Anzac Parade would be reviewed by a suitably qualified arborist during detailed design, once the final tunnel construction technique has been determined. To minimise the potential impacts associated with dewatering activities on the viability of the surrounding Figs, an irrigation strategy would be developed for any Fig that is deemed to be at risk of being affected by a potential lowering of the water table.

ID No.	Environmental management measure – construction phase
T.9	The health of Fig trees within Moore Park would be monitored by a suitable qualified arborist both during and post construction. Appropriate management responses would be developed by a suitably qualified arborist, in consultation with Moore and Centennial Parks Trust so as to minimise impacts to any potentially affected trees.
~~**T.10**~~	~~Planted trees within George Dan Reserve and trees adjacent to the section of the CSELR route along the busway between Robertson Road and Doncaster Avenue would be retained.~~ **Note: This mitigation measure has been consolidated with mitigation measure N.2.**
T.11	The impacts associated with the Randwick stop would be managed through the development of a detailed landscape strategy for High Cross Park, which would incorporate improvements such as new tree planting, a public plaza and new landscaping. New trees would provide shade and would partly compensate for the loss of existing trees.
T.12	Where possible, trees would be planted within the same locality from which they are removed.
Visual and landscape	
U.1	Where feasible and reasonable, the elements within construction-sites would be located to minimise visual impacts e.g. materials and machinery would be stored back behind fencing.
U.2	Lighting of compounds and works sites would be restricted to agreed hours and security needs and in accordance with the CEMP.
U.3	Visual mitigation would be implemented as soon as feasible and reasonable, and remain for the duration of the construction period.
U.4	Minimise light spill from the light rail construction corridor into adjacent visually sensitive properties by directing construction lighting into the construction areas and ensuring the site is not over-lit. This includes the sensitive placement and specification of lighting to minimise any potential increase in light pollution.
U.5	Regular maintenance of site hoarding and perimeter site areas would be undertaken, including the prompt removal of graffiti.
U.6	On completion of construction, work sites and other land occupied temporarily would be reinstated to their existing condition.
U.7	Work sites and site access would be away from the forecourt of the Museum of Contemporary Art (MCA) and the Circular Quay area, where possible.
U.8	The CSELR proposal would be constructed in such a way that would ~~Avoid~~ avoid any negative impacts to the heritage listed Tank Stream Fountain in Alfred Street plaza.
U.9	Schedule works to minimise impacts on special events, such as Anzac Day, New Year's Eve and Vivid Festival events, where possible. This should include staging works to minimise impacts on areas including Circular Quay, Martin Place (Cenotaph), High Cross Park and Belmore Park where those works would clash with special events, where feasible.
U.10	Identify opportunities ~~for an artistic approach or~~ the incorporation of art, colours and materials that complement the surroundings as appropriate (for example parkland or University of NSW surroundings) to treatment of the site hoarding and enclosure, in consultation with councils and potentially local community groups and schools. This should include consideration of day and night time activation of the exterior of the site. Privacy considerations for adjacent residential properties or other sensitive receivers as a result of site hoardings would also considered.
U.11	At Circular Quay, identify opportunities for an artistic/historic harbour side narrative approach to the treatment of the site hoardings and enclosures, in collaboration with Customs House.
U.12	Position-site compounds and construction areas to avoid direct impacts on the structure or use of the Martin Place Cenotaph.
U.13	Position equipment and site access away from the Queen Victoria statue and Ibero-American Statue Plaza as far as practicable.

ID No.	Environmental management measure – construction phase
U.14	Consolidate site equipment and facilities to maximise the area of useable public green space, and maintaining pedestrian permeability where reasonable and feasible.
U.15	Maintain permeability or identify an alternative pedestrian route within Moore Park (to replace the key pedestrian route between Parkham Street and Driver Avenue affected by construction) by minimising encroachment onto the existing playing fields.
U.16	Reinstate planting, where removed for construction purposes, on the periphery of Centennial Park in the Randwick Precinct in accordance with the Centennial Parklands Conservation Management Plan.
U.17	Locate site equipment and facilities to minimise impact to the Parklands Sports Centre, maintaining access or providing alternative access to the existing sports facilities.
U.18	Where possible, site equipment and facilities would be consolidated to minimise the intrusion into the University campus grounds.
U.19	Maintain access or provide alternative pedestrian access to all existing University campus facilities.
Built and non-Indigenous heritage	
V.1	The mitigation measures for Historical Archaeological Management Units (HAMUs) listed in section 6.2.2 of Technical Paper 5 (*Heritage Impact Assessment*) of the EIS would be implemented, in accordance with the HAMU zones documented in Figures 4.4 to 4.12 of Technical Paper 5 (*Heritage Impact Assessment*) of the EIS.
V.2	The following mitigation measures would be implemented for the Tank Stream: ▪ Physical protection would be provided through construction of bridging structure to retain integrity of the Tank Stream, as required. ▪ Management would be implemented in accordance with policies in Sydney Water's Tanks Stream Conservation Management Plan. ▪ Consultation would be undertaken with Sydney Water, City of Sydney and NSW Heritage Division of OEH.
V.3	The following mitigation measures would be implemented for Alfred Street/Herald Square: ▪ Implementation of an archaeological testing program. ▪ Open area excavation and archival recording during site works.
~~**V.4**~~	~~The proposed construction compound in part of First Fleet Park would be planned to retain significant elements of the park, including plantings, monuments and landscape features and to minimise impacts on the setting of the Sydney Opera House.~~ **Note: This mitigation measure has been consolidated with mitigation measure D.1.**
V.5	The following mitigation measures would be implemented for First Fleet Park: ▪ The potential historical archaeological resource would be managed in accordance with the policies outlined in the *First Fleet Park Conservation Management Strategy*. ▪ Consultation would be undertaken with the Sydney Harbour Foreshore Authority. ▪ ~~Ground disturbance works within First Fleet Park HAMU would be avoided, where feasible.~~ ▪ No excavation would be undertaken within First Fleet Park to minimise the risk of impacting on potential subsurface archaeology. ▪ Services, if required, would be above ground or installed within existing service trenches. ▪ The subsurface archaeological remains within First Fleet Park would be protected from compaction or movement of vehicles over the park's ground surface. ▪ The scope of appropriate ground works within First Fleet Park HAMU would be developed in consultation with a suitably qualified archaeologist and Sydney Harbour Foreshore Authority to ensure the impact on the archaeological resource is as minor as possible. ▪ A photographic archival recording of First Fleet Park would be undertaken prior to works commencing.

ID No.	Environmental management measure – construction phase
V.6	Works in George Street north HAMU, Ward Park HAMU, Devonshire Street Central HAMU (particularly in the location of the proposed substation), Devonshire Street East HAMU, Kensington/Kingsford HAMU and the University of NSW HAMU are likely to require some open area excavation and archival recording during site works, and post-excavation analysis and reporting. The nature and intactness of the archaeological resource may warrant interpretation. Advice from an archaeological specialist would be obtained where these areas are affected.
V.7	In respect of HAMUs within the Surry Hills Precinct, in the unlikely event that remains associated with unrecorded activities of early land grants and estates are identified and assessed as of State significance, this archaeology would be managed in accordance with Zone 1 mitigation measures
V.8	Within the Olivia Gardens HAMU, mitigation measures for areas outlined as Zone 3 within the basement footprint of the Olivia Gardens building would apply.
V.9	The following mitigation measures would be implemented for the Moore Park West HAMU and Moore Park East HAMU: ▪ Works in this HAMU where air raid shelters were located are likely to require some open area excavation and archival recording during site works, as well as post excavation analysis and reporting (limited to the extent of the area affected by the CSELR proposal). The nature and intactness of the archaeological resource may warrant interpretation. ▪ Areas with nil archaeological potential would be managed in accordance with the outlined Zone 4 mitigation measures.
V.10	Mitigation measures, as outlined for Zone 2 in section 12.8.4 of the EIS, would be implemented for the Rozelle maintenance depot HAMU.
V.11	If human remains were to be discovered during any phase of works associated with the CSELR proposal, works would cease immediately in the surrounding area. Any finding would need to be reported immediately to the NSW Coroner's Office and/or the NSW Police. If the remains are suspected to be Aboriginal, the Office of Environment and Heritage would also need to be contacted. A specialist would also be consulted to determine the nature of the remains. If skeletal remains are identified at Town Hall, Eddy Avenue or Chalmers Street they would be managed in accordance with Zone 1 strategies and, at a minimum, managed in accordance with the Heritage Division guideline *Skeletal Remains: Guidelines for Management of Human Skeletal Remains*, and exhumed and reinterred at an appropriate location. If identified, consultation with the NSW Heritage Division of OEH would be required.
V.12	The following mitigation measures would be implemented for Belmore Park: ▪ The subsurface archaeological remains within Belmore Park would be protected from compaction or movement of vehicles over the park's ground surface. ▪ Significant trees and landscaping to be retained within Belmore Park would be protected from damage by vehicular or machinery movement. ▪ Significant landscape elements (such as sandstone kerbing) that are to be removed from Belmore Park for the construction compound would be salvaged, catalogued and stored for reinstatement following completion of construction works. ▪ A photographic archival recording of Belmore Park would be undertaken prior to works commencing.
V.13	The following mitigation measures would be implemented for Martin Place, the Cenotaph and General Post Office: ▪ The detailed design of any works in Regimental Square would retain and conserve the memorial and associated significant plantings. ▪ The memorial and significant associated landscaping would be retained and protected during construction works. ▪ A photographic archival recording of Regimental Square would be undertaken prior to any works commencing in this area. ▪ No new permanent above ground structures would be introduced into Martin Place, particularly in the vicinity of the Cenotaph.

ID No.	Environmental management measure – construction phase
	▪ The size and material of any required access hatches for the below ground substation in Martin Place would minimise visual impacts on the ground plane of Martin Place. ▪ The design of necessary substation ventilation shafts, access hatches, and other infrastructure would minimise visual impacts on the Cenotaph. ▪ The condition of the Cenotaph would be assessed prior to commencement of construction works for the proposed substation and monitored during construction. ▪ The planning of the works compound would ensure that access is provided to the Cenotaph for the groups who use the memorial.
V.14	A photographic archival recording of the principal elevations of Daking House would be undertaken prior to works commencing.
V.15	Significant fabric of the Elizabeth Street Gardens that is to be removed, such as the edging and the palms, would be salvaged, catalogued and stored for possible reinstatement (or partial reinstatement) following completion of construction works.
V.16	A photographic archival recording of the parts of Central Railway Station to be affected by the CSELR works, including the Elizabeth Street Gardens and the Chalmers Street boundary wall, would be undertaken prior to works commencing.
V.17	Replanting of trees would be undertaken along Devonshire Street where possible following completion of construction works in accordance with the Landscape Strategy (Appendix F of the EIS).
V.18	The mosaic mural and sandstone monument in Wimbo Park would be retained where feasible and conserved. If they cannot be retained in situ, relocation of these elements within the proposed new landscaping would be undertaken in accordance with a management plan or other approved document.
V.19	The design of necessary substation ventilation shafts, access hatches, and other infrastructure in Ward Park would minimise impacts on the spatial quality of Ward Park.
V.20	The following mitigation measures would be implemented for Centennial Park, Moore Park, Queens Park and the Moore Park Conservation Area: ▪ The area required for excavation would be minimised to reduce the impact of the works on Moore Park. ▪ The size and form of the tunnel portal structures would be as recessive as possible to reduce permanent visual impacts on the landscape of Moore Park. Any new structures/infrastructure would be recessive and allow the broader landscape to remain the dominant feature. ▪ The location and design of the Moore Park stop would minimise impacts on significant views of the Sydney Cricket Ground and former RAS buildings from Anzac Parade and within Moore Park. ▪ Where feasible, areas excavated for construction of the CSELR would be reinstated to the current condition on completion of construction. This includes areas to be used for construction compounds/laydown areas. ▪ A photographic archival recording of the areas of Moore Park that would be subject to impacts from construction of the CSELR, including the Anzac Parade avenue of trees, would be undertaken prior to works commencing.
V.21	Where significant trees must be removed in the Martin Road Conservation Area suitable replacements would be made, where possible, to screen the conservation area from the CSELR.
Socio-economic	
W.1	Alternate routes to public areas and open spaces areas and community facilities impacted by the construction of the proposal would be identified including The Rocks, Belmore Park, the Sydney Dental Hospital and other community services (churches, schools etc.).

ID No.	Environmental management measure – construction phase
W.2	The following mitigation measures would be implemented regarding safety and security: ▪ The CEMP would identify risks to safety and security on a site-by-site basis and provide appropriate mitigation measures. ▪ Detailed design would incorporate the principles of CPTED. ▪ *Disability Discrimination Act 1992* requirements would be adopted. ▪ Construction lighting standards would be met with the aim of minimising lighting impacts outside the construction corridor. ▪ Hoarding/fence lines would be erected to maximise sight lines for pedestrians and avoid hiding places and blind spots to improve pedestrian personal security. ▪ Any gantry arrangements would have internal lighting. ▪ Safety and security impacts would be addressed as part of the CEMP.
W.3	The following mitigation measures would be implemented regarding health and wellbeing, in addition to measures to manage noise impacts (refer measures S.1–S.7) and air quality impacts (refer measures AC.1–AC.24): ▪ The CEMP is to identify risks to health and wellbeing on a site-by-site basis and would include appropriate mitigation measures. ▪ The CEMP would account for cumulative impacts of construction given concurrent works in the precinct. ▪ Health impacts would be addressed as part of the CEMP, including watering exposed areas to minimise dust impacts, using non-tonal reversing indicators, and fitting construction machinery with appropriate muffling devices.
W.4	Access management plans would be prepared in liaison with businesses and landowners to understand their servicing and delivery requirements. These plans would then identify and implement means of maintaining (and where possible enhancing) access to businesses for deliveries and servicing during both the construction and operational phases of the CSELR proposal.
W.5	A business landowner and engagement management plan would support the preparation and effective implementation of the access management plans. It would also identify and implement means by which to keep businesses informed of the CSELR proposal and methods to proactively support businesses through the construction phase.
W.6	Place managers would assist with ensuring needs of disadvantaged residents are accounted for, particularly as some residents may not have access to telephone or email facilities or may not speak English comfortably or as a first language.
Hydrology, drainage and surface water quality	
X.1	During construction any water collected from the worksites would be treated and discharged in accordance with current guidelines to avoid any potential contamination or local stormwater system impacts. These guidelines would include the Australian and New Zealand Environment and Conservation Council (ANZECC) (2000) *Guidelines for Fresh and Marine Water Quality* and Landcom's (2004) *The Blue Book – Managing Urban Stormwater: Soils and Construction*.
X.2	Where existing longitudinal pit and pipe drainage exists and needs to be reinstated or repaired, appropriate scour protection measures would be reinstated or improved at outlets to watercourses or drainage lines. Typical scour protection might include concrete energy dissipating structures or dumped stone rip rap.
X.3	During construction, the potential for localised flooding of excavation-sites would need to be managed. Water pumping facilities may be required at specific locations along the alignment to remove any water that would pool within or adjacent to construction areas. Temporary drainage pipes or channels would also be provided to drain any open excavation areas.
Land stability, soils and contamination	
Y.1	Construction of the cut-and-cover tunnel across Moore Park would employ construction techniques aimed at minimising the risk of settlement.

ID No.	Environmental management measure – construction phase
Y.2	Precondition surveys of building and structures in the vicinity of the Moore Park tunnel would be undertaken prior to the commencement of construction of the structure. Monitoring would continue for identified baseline buildings and structures throughout the construction period.
Y.3	As part of the detailed design, a Phase 2 Environmental Site Assessment (ESA) would be undertaken to further characterise the nature of potential contamination along the proposed CSELR alignment. The Phase 2 ESA would focus on the following: ▪ General contamination along the route. This would be assessed through a program of conventional field testing involving groundwater wells, soil cores and test pits and lab testing of collected samples. Test locations would be derived from a Sampling, Analysis and Quality Plan (SAQP) which would be developed based on the Phase 1 ESA discussed in Section 10.3.2 of the EIS. ▪ Building contamination (including asbestos and lead paint). This would include areas where demolition works are proposed (e.g. Olivia Gardens and at the Rozelle maintenance depot).
	▪ Contamination from existing underground services (e.g. pits, pipes and substations). This would involve a review of existing detailed utilities data including 'Dial-Before-You-Dig', survey and data provided by asset owners (e.g. hazard logs) to categorise the likelihood of contamination, followed by field testing to confirm the presence of contaminated materials.
Y.4	A remediation strategy would be developed (as part of the CEMP) based on the results of the Phase 2 ESA. This strategy would outline any measures required to manage contaminated materials during construction. The strategy would also include a protocol to manage any unexpected disturbance of potentially contaminated material (which was not identified during the Phase 2 ESA). The remediation strategy would identify opportunities for remediation of affected areas prior to or during construction where the Phase 2 ESA confirms the presence of contaminated materials in concentrations above the intended land use criteria, as specified in the following guidelines: ▪ *Contaminated Site Guidelines for Assessing Service Station Sites* (EPA 2004) ▪ *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1)* (NEPM) (National Environment Protection Council (NEPC, 2013) ▪ *Waste Classification Guidelines* (DECCW 2009).
Y.5	All contaminated materials disturbed during construction would be managed and either re-used or disposed of appropriately in accordance with all relevant legislation and guidelines, including the *Protection of the Environment Operations Act 1997*, the *Waste Avoidance and Resource Recovery Act 2001*, the NSW Department of Environment and Climate Change (DECC 2009a) *Waste Classification Guidelines* and the National Environment Protection Council (NEPC, 2013) *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1)* (NEPM).
Y.6	Segregated materials would be inspected and sampled, with samples submitted for analytical testing for contaminants of concern. Results would be compared to relevant assessment criteria to assess whether there is any potential health or environmental risk posed by re-using the material on-site. Where concentrations of contaminants are above the intended land or appropriate human/ecological health criteria, the assessment would identify opportunities for remediation of affected areas.
Y.7	Attempts would be made to re-use material on-site where assessment indicates that there is no risk, or where materials can reasonably and feasibly be remediated.
Y.8	Areas requiring remediation would be validated to confirm that the surrounding soil meets site land use criteria requirements.
Y.9	In the event of any previously unidentified contaminated materials being identified on-site during construction, works in the affected area would cease and would not recommence until sampling and remedial actions are instigated. This would be undertaken in accordance with the applicable EPA guidelines and statutory requirements. Work health and safety requirements and appropriate management measures would be followed for works that have the potential to contain contaminated soil.
Y.10	Fill material would remain on-site where possible and where contaminant concentrations meet the site assessment criteria.

ID No.	Environmental management measure – construction phase
~~**Y.11**~~	~~All material requiring off-site disposal would be appropriately tested and classified against the *Waste Classification Guidelines* (DECC 2009).~~ **Note: This mitigation measure has been consolidated with mitigation measure Y.5.**
Y.12	A hazardous material inspection would be undertaken of any areas where historical infrastructure is to be disturbed and/or demolished to assess the material to be disturbed for the presence of asbestos and/or lead paint. Appropriate management plans would be developed ~~(such as an Asbestos Management Plan)~~ to outline the management and handling of hazardous materials during construction.
Y.13	Where there is a potential for the presence of hazardous materials to be disturbed, for example during demolition activities or excavation of underground services, the works would be monitored by an occupational hygienist.
Y.14	An Asbestos Management Plan would be developed in accordance with the *Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia* (Western Australia Department of Health 2009) and included as part of the CEMP.
Y.15	Where suspected asbestos and/or lead paint containing materials are identified, work in the affected area would cease, and an investigation would be undertaken to determine the nature, extent and degree of contamination. A report would be prepared which would include a methodology for the removal, handling and disposal of the contaminated material. Works would only recommence upon receipt of a validation report from a suitably qualified occupational hygienist that the contaminated materials had been removed.
Y.16	Erosion and sediment control plans would be prepared for each worksite in accordance with Volume 2D of *Managing Urban Stormwater: Soils and Construction* (DECC 2008). The erosion and sediment control plans would be established prior to the commencement of construction and be updated and managed throughout as relevant to the activities during the construction phase. Clean water would be diverted around the work site in accordance with *Managing Urban Stormwater: Soils and Construction* (DECC 2008).
Y.17	Stabilised surfaces would be reinstated as quickly as practicable after construction.
Y.18	All stockpiled materials would be stored in bunded areas and kept away from waterways to avoid sediment entering the waterways.
Y.19	Sediment would be prevented from moving off-site and sediment laden water prevented from entering any watercourse, drainage line or drainage inlet.
~~**Y.20**~~	~~Clean water would be diverted around the work site in accordance with Landcom's (2004) *The Blue Book – Managing Urban Stormwater: Soils and Construction*.~~ **Note: This mitigation measure has been consolidated with mitigation measure Y.16.**
Y.21	Erosion and sediment control measures would be regularly inspected (particularly following rainfall events) to ensure their ongoing functionality.
Y.22	Erosion and sediment control measures would be left in place until the works are complete and areas are stabilised.
~~**Y.23**~~	~~Works would be avoided during rainfall (or whilst the ground remains sodden) to minimise vehicle disturbance to the topsoil.~~
Groundwater	
Z.1	A construction groundwater management plan would be prepared prior to construction, and would detail the control measures that aim to minimise potential impacts to groundwater resources and receiving environments during construction. The purpose of the plan is to provide practical impact mitigation principles and measures for the design and construction of the proposal consistent with relevant legislation and standard guidelines.

ID No.	Environmental management measure – construction phase
Z.2	The construction groundwater management plan would include details of a groundwater monitoring program, which would be implemented prior to construction to identify changes in groundwater quality and levels during the construction. The monitoring program would be developed in consultation with the NSW Office of Water.
Z.3	Excavation techniques would be adopted to minimise impacts on aquifers.
Z.4	Groundwater encountered during the construction of the proposal would be tested, managed and disposed of in accordance with the *Waste Classification Guidelines* (DECC 2009) and Transport for NSW's (Transport for NSW 2012a) *Water Discharge and Re-use Guideline*. Groundwater would be disposed to ensure it does not cause the pollution of waters in accordance with Section 120 of the *Protection of the Environment Operations Act 1997*.
Z.5	Hazardous material procedures (including procedures for managing spills and refuelling and maintaining construction vehicles/equipment) would be developed and implemented as part of the CEMP to minimise potential for groundwater quality impacts due to chemical spills.
Z.6	~~The following construction~~ Construction techniques would aim ~~sequence may be used~~ to reduce the volume of dewatering required at the deeper sections of the tunnel. ▪ ~~Extend alternate diaphragm wall panels to form a groundwater cut-off in the swamp deposits underlying the Botany Sands. The other panels would be founded at a shallower depth to allow continued groundwater flow towards Botany Bay.~~ ▪ ~~Construct bentonite slurry cross walls at approximately 50 metre centres to confine the extent of drawdown.~~ ▪ ~~Excavate the entire tunnel to the underside of headstock level (excluding Anzac Parade), which is expected to be above groundwater level.~~ ▪ ~~Dewater one bay at a time with a line of wells at the centre of the excavation.~~ ▪ ~~Deep excavation of one bay at a time and construct the base slab.~~
Aboriginal heritage	
AA.1	All contractors would receive a Heritage induction advising and informing them of the archaeological potential and actions to be implemented in the event of any unexpected remains.
AA.2	A qualified archaeologist would be nominated and available to attend in the event that unidentified archaeological remains are discovered during construction.
~~**AA.3**~~	~~Where required, local Aboriginal stakeholders would be involved and consulted with during Aboriginal archaeological works.~~ **Note: This mitigation measure has been consolidated with mitigation measure I.4.**
AA.4	Should Aboriginal objects or other archaeological evidence be identified in these areas during works, works would cease in the immediate area and the archaeologist contacted to assess the evidence. Additional investigation, such as salvage excavation, may be required.
~~**AA.5**~~	~~If human remains were to be discovered during any phase of works associated with the CSELR proposal, works would cease immediately in the surrounding area. Any finding would need to be reported~~ immediately to the NSW Coroner's Office and/or the NSW Police. If the remains are suspected to be ~~Aboriginal, the Office of Environment and Heritage would also need to be contacted. A specialist would also be consulted to determine the nature of the remains.~~ **Note: This mitigation measure has been consolidated with mitigation measure V.11.**
Biodiversity	
AB.1	The location of the hollow-bearing trees identified in this EIS would be confirmed to inform and plan procedures for the removal of these habitat features.
AB.2	Nearby suitable habitat would be identified for the release of any fauna that may be encountered during the pre-clearing or habitat removal processes.

ID No.	Environmental management measure – construction phase
AB.3	The presence of flora and fauna species and habitat on-site would be checked before clearing begins such as the presence of bird nests or trees that contain hollows.
AB.4	An appropriate level of emergence survey would be undertaken to confirm absence of microbats in any buildings or structures likely to be directly impacted by the works.
AB.5	Prior to construction, site personnel would be adequately informed of environmental management procedures including, but not limited to, issues related to flora and fauna management, disease prevention, erosion and sediment control.
AB.6	Implementation of mitigation measures (refer measures T.1 to T.12) to ensure protection and management of all trees identified to be retained.
~~**AB.7**~~	~~Clearing of vegetation would be restricted to vegetation that is absolutely required to be removed in order to undertake work.~~ **Note: This mitigation measure has been consolidated with mitigation measure T.1.**
AB.8	Noxious weeds within the study area would be managed in accordance with the *Noxious Weeds Act 1993*.
AB.9	The potential for the introduction or spread of plant diseases would be managed. Management techniques may include ensuring that equipment is clean prior to commencement of earthworks, disease free certification of landscaping materials, and disposal of pathogen-contaminated soils at appropriate weed disposal facilities.
Air Quality	
AC.1	Dust minimisation measures would be developed and implemented prior to commencement of construction.
AC.2	Methods for management of emissions would be incorporated into project inductions, training and pre-start talks.
AC.3	Activities with the potential to cause significant dust emissions (such as bulk earthworks or demolition works) would be identified in the CEMP. Work practices which minimise emissions during these activities would be investigated and applied where reasonable and feasible.
AC.4	Vehicle movements would be limited to designated site entrances/exits, haulage routes and parking areas. Site exits would be fitted with hardstand material, rumble grids or other appropriate measures to limit the amount of material transported off-site (where required). Site speed limits of 20 kilometres per hour would be imposed on all construction vehicles at the site; although lower speeds may be required on unsealed roads.
AC.5	Work sites and exposed areas would be screened to assist in capturing airborne particles and reduce potential entrainment of particles from areas susceptible to wind erosion.
AC.6	Visually monitor dust and where necessary implement the following measures: ▪ Apply water (or alternative measures) to exposed surfaces that are causing dust emissions. Surfaces may include any stockpiles, hardstand areas and other exposed surfaces (for example recently graded areas and those areas recently scraped). ▪ Regular watering would ensure that the soil is moist to achieve 50 per cent control of dust emissions from scrapers, graders and dozers. ▪ Appropriately cover loads on trucks transporting material to and from the construction-site. Securely fix tailgates of road transport trucks prior to loading and immediately after unloading. ▪ Limit vehicle speeds along unsealed construction access routes. ▪ Apply water to internal unsealed access roadways and work areas. Application rates would be related to atmospheric conditions (e.g. prolonged dry periods) and the intensity of construction works. Paved roads would be regularly swept and watered when necessary. ▪ Promote and maintain awareness of weather forecasts to support anticipation of unfavourable conditions.

ID No.	Environmental management measure – construction phase
AC.7	Dust generating activities (particularly clearing and excavating) would be avoided or minimised during dry and windy conditions. Street sweeping of the CSELR alignment would be undertaken where an excessive build-up of material has occurred.
AC.8	Minimise drop heights during loading and unloading of bulk materials.
AC.9	Exposed areas and stockpiles would be limited in area and duration. For example, stage vegetation stripping or grading where possible, cover unconsolidated stockpiles, or apply hydro mulch or other revegetation applicant to stockpiles or surfaces left standing for extended periods.
AC.10	Revegetation or rehabilitation activities would proceed once construction activities are completed within a disturbed area.
~~**AC.11**~~	~~Onsite monthly dust deposition monitoring would be undertaken to measure dust fallout at selected sensitive receivers during construction.~~
~~**AC.12**~~	~~Real time dust monitoring would be undertaken during significant dust generating activities close to sensitive receivers.~~
AC.13	Construction plant and equipment would be well maintained and regularly serviced so that vehicular emissions remain within relevant air quality guidelines and standards. Where feasible, construction plant and equipment with lower emissions and higher energy/fuel efficiency would be selected.
AC.14	Emissions from trucks would be regulated in accordance with the requirements prescribed in National Environment Protection Council's (2001) *In Service Emission Testing – pilot study, fault identification and effect of maintenance* (diesel vehicle emissions).
AC.15	All construction vehicles would be tuned so as to not release excessive level of exhaust smoke, and would be compliant with the NSW Office of Environment and Heritage's Smokey Vehicles Program under the NSW *Protection of the Environment and Operations Act 1997* and associated regulations.
AC.16	All on-road trucks would comply with the latest emission standards.
AC.17	All new off-road construction equipment would meet, at a minimum, the United States Environmental Protection Agency's Tier 3 emission standards for non-road diesel engines.
AC.18	All chemicals and fuels would be stored in sealed containers as per appropriate regulations and guidelines.
AC.19	The onsite storage of fuel would be kept to a minimum.
AC.20	Unloading of fuels (diesel or liquefied nitrogen gas) would be vented via return hoses that recirculate vapours from delivery to receiver.
AC.21	Chemical/fuel storage tanks would be fitted with a conservation vent (to prevent air inflow and vapour escape until a pre-set vacuum or pressure develops).
AC.22	Strategies would be investigated to reduce the usage of chemical and fuels in addition to using alternative fuel technologies as recommended in the NSW Office of Environment and Heritage's *Action for Air – 2009 Update* (DECCW 2009a). Particular focus would be on those products with the potential to release high levels of air toxics.
AC.23	The proponent shall provide a detailed Air Quality Report prepared by a suitably qualified professional to confirm there will be no adverse impacts to air quality from all proposed operational and cleaning processes proposed to be carried out in the LRV stabling facility. Final plans and reports are to be submitted to the Director General for approval in consultation with the ATC prior to commencement of works.
Utilities	

AD.1	Services or utilities that may be impacted by the CSELR would be protected and/or relocated using the following hierarchy: ▪ Utilities within Zone 1 (as shown in Figure 10.8 of the EIS) are likely to require relocation due to the physical clash with the structural rail slab (including its construction). ▪ Utilities crossing Zone 2 (as shown in Figure 10.8 of the EIS) would be protected where feasible. ▪ Utilities crossing Zone 3 (as shown in Figure 10.8 of the EIS) may require protection but have the potential to remain undisturbed, subject to accurate identification and consultation with the relevant utility authorities.
ID No.	**Environmental management measure – construction phase**
AD.2	All appropriate service utility providers (e.g. electricity, communication, water and other utility services) would continue to be consulted throughout construction.
Greenhouse gas	
AE.1	Methods for management of greenhouse gas emissions would be incorporated into site inductions, training and pre-start talks.
AE.2	Activities with the potential to cause substantial greenhouse gas emissions (such as material delivery and loading and bulk earthworks) would be identified. Work practices which minimise greenhouse gas emissions during these activities would be investigated and applied where reasonable and feasible. These would potentially include: ▪ the use of biodiesel and other low carbon fuels in vehicles and equipment ▪ the use of fuel-efficient construction equipment with the latest technology.
AE.3	Construction services and materials would be procured locally, where practicable, to minimise the distance travelled and therefore greenhouse emissions from vehicles accessing the site.
AE.4	During construction planning, deliveries would be managed in an efficient manner to minimise the number of trips required and therefore reduce the amount of greenhouse gas emissions.
AE.5	Energy-efficient work practices would be implemented, such as switching off construction plant, vehicles and equipment when not in use to minimise idling.
AE.6	Regularly monitoring, auditing and reporting on energy, resource use and associated greenhouse gas emissions would be undertaken as part of the environmental reporting requirements specified within the CEMP.
AE.7	Selection of materials during construction planning to ensure products that reduce embodied carbon are considered and used.
Hazards and risks	
AF.1	Hazards and risks associated with construction activities would be identified prior to construction. Management measures for each identified hazard/risk would be developed. A process for regularly reviewing work practices/procedures would be implemented throughout construction to identify, report and respond to any new environmental hazards/risks.
AF.2	Construction worksites located adjacent to public areas would be screened (where required) to minimise risks of injury as a result of unsecured debris, tools and other objects.
Regional cumulative impacts	
AG.1	The following construction management plans would incorporate measures, where required, to manage cumulative construction impacts: ▪ construction traffic management plan ▪ construction noise and vibration management plan ▪ air quality and dust management plan ▪ construction compounds and ancillary facilities management plan ▪ earthworks management plan – which would include measures to manage water quality.

Table 8.3 Revised environmental management measures for the CSELR proposal – operation

ID No.	Environmental management measure – operational phase
Traffic, transport and access	
AH.1	A network management plan would be developed for the CSELR proposal during detailed design to identify key management measures that would be implemented to minimise impacts to journey times and congestion levels. Transport for NSW would be responsible for developing and maintaining the network management plan in consultation with stakeholders.
AH.2	Transport for NSW would work alongside the relevant road authorities to develop appropriate demand management strategies for the construction and operational phases of the CSELR proposal. These demand management strategies would be integrated with network optimisation measures being developed as part of the Sydney City Centre Access Strategy, to ensure their maximum effectiveness.
AH.3	In conjunction with the demand management measures, targeted traffic management upgrades would be undertaken to improve general traffic circulation in the vicinity of the CSELR proposal. Within the CBD, these measures would also form part of the Sydney City Centre Access Strategy which identifies the priority traffic routes shown in Figure 9.12 of the EIS and the redesign of the city centre bus network. Outside of the CBD, Transport for NSW would continue to work with local councils and the Roads and Maritime Services to mitigate the local traffic impacts and potential increased traffic flows that may occur on local roads as a result of the CSELR proposal.
AH.4	Key road network changes to accommodate the introduction of light rail within the CBD and South East, as described in section 5.2.7 of the EIS, section 9.2 of the EIS and the relevant sections of the precinct chapters of the EIS (sections 12.3.2, 13.3.2, 14.3.2, 15.3.2, 16.3.2) would be implemented as part of the CSELR.
AH.5	Transport for NSW would continue to work with City of Sydney, Randwick City Council and Roads and Maritime Services to mitigate the local traffic impacts and potential increased traffic flows that may occur on the road network as a result of the CSELR proposal.
AH.6	The following intersections would be signalised as part of the CSELR to manage light rail conflicts with pedestrian and traffic movements: ▪ Devonshire Street/Marlborough Street intersection. ▪ Devonshire Street/Bourke Street intersection. ▪ South Dowling Street southbound and northbound traffic lanes at the CSELR crossing point. ▪ Wansey Road/Alison Road intersection would be signalised (on all arms) to provide pedestrian access from the residential catchments in the north and east to the Wansey Road stop. ▪ High Street/Wansey Road intersection would be signalised to accommodate pedestrians and the light rail turning movements between Wansey Road and High Street. Pedestrian crossings would be provided across Wansey Road and the eastern arm of High Street as a minimum, which would replace the existing zebra crossing on High Street. ▪ High Street/Hospital Road intersection. ▪ High Street/Clara Street intersection. ▪ The existing Nine Ways roundabout would be reconstructed and upgraded to incorporate traffic signals. TO BE AMENDED BY PROPOSED CONDITION A.40
AHXX	TfNSW to provide an Event Management Transport Plan for the event stop at RRR to ensure RRR can operate at maximum capacity for events without the need for additional cost to ATC. To include a crisis management plan during events where light rail operations are halted.

ID No.	Environmental management measure – operational phase
AH.7	All existing property accesses along the CSELR would be maintained during the operational phase of the CSELR proposal; however, certain restrictions are likely to apply which would be implemented by the relevant road authority and could include: ▪ Access restrictions on George Street implemented by the City of Sydney to provide for appropriate safety and amenity for pedestrians. These measures would be determined by City of Sydney, in consultation with Transport for NSW. ▪ Left-in, left out-out limitations on driveway access along the proposed CSELR corridor, where feasible. ▪ Property accesses along Devonshire Street would be maintained; however, access arrangements to some properties may change. Ongoing consultation would be undertaken with owners of properties with direct access onto the CSELR corridor to determine specific access arrangements.
AH.8	General traffic access to the pedestrianised section of George Street (between Bathurst Street and Hunter Street) would be restricted through the introduction of appropriate vehicle restrictions. However, exceptions to this control would be provided for local access, service delivery and emergency vehicles to access driveways and loading zones (at a maximum speed of 10 kilometres per hour).
AH.9	Within the George Street pedestrian zone, signalised pedestrian crossing facilities would be provided on all arms of existing signalised intersections to provide controlled crossing points of the light rail alignment.
~~**AH.10**~~	~~Pedestrian access to the proposed Eddy Avenue coach station island platform would be provided via the existing Eddy Square pedestrian crossing at the eastern end. A new crossing at the western end would be provided to allow pedestrian movement between the existing coach booking office and the coach platform.~~ **Note: This mitigation measure has been consolidated with mitigation measure E.3.**
AH.11	The existing access to the Sydney Trains car park located opposite Devonshire Street would be integrated with the new traffic signals proposed at this location.
AH.12	Loading dock access on the southern side of Eddy Avenue would require management across the light rail alignment through time restricted access and/or audio visual warnings. Suitable treatment measures to address this issue would be identified during detailed design.
AH.13	Access for emergency vehicles would be maintained at all times along the length of the CSELR.
AH.14	Existing City of Sydney bicycle routes crossing George Street would be maintained, however George Street would no longer be promoted as a bicycle route, with cyclists being directed to alternate existing north-south corridors such as Pitt, Castlereagh and York Streets.
AH.15	The existing provision of short and long stay parking available along Chalmers Street south of Devonshire Street would be retained.
AH.16	Replacement parking to offset parking spaces removed at the Langton Centre as a result of the CSELR would be provided nearby, most likely along the northern side of the new Wimbo Park open space on the site of the Olivia Gardens apartment complex, as shown in Figure 6.5 of the Submissions Report. The final location and number of replacement parking spaces would be determined in consultation with the Langton Centre and City of Sydney. Access to this facility would be maintained at all times.
AH.17	The existing pedestrian/cyclist bridge and associated crossings located adjacent to Parkham Street would be relocated to the proposed light rail bridge structure.
AH.18	The existing pedestrian and cycle crossing linking Arthur Street to Moore Park would be retained to provide a continuous cycle link between Moore Park and Central Railway Station through Surry Hills. Appropriate signposting would be provided to direct cyclists from the crossing location at Devonshire Street and Bourke Street.
AH.19	Light rail vehicles would be given priority over other traffic along Devonshire Street to ensure traffic and pedestrians are not adversely affected by the queuing of longer light rail vehicles at traffic signals during special events (which could block adjacent intersections).

ID No.	Environmental management measure – operational phase
AH.20	Adoption of appropriate parking management measures (parking controls) to balance supply and demand would be considered. ~~Transport for New South Wales would work through implementation of these measures to manage kerbside activity with the City of Sydney in the City Centre and Surry Hills precincts.~~ Local area parking management in the precincts surrounding the CSELR should primarily provide: ▪ For residents — local area residential parking schemes. To provide for residential parking, particularly during the pre-morning and post-afternoon peaks. ▪ For businesses — short-term timed parking to encourage turnover, trade and increase capacity for customers. Transport for NSW would work with City of Sydney and Randwick City Council to refine these measures. These councils would lead the development and implementation and management of general parking displaced by the CSELR and the relocated special uses. Council would be responsible for the implementation of any changes to the function and management of on-street kerbside activity within the area of influence of the CSELR proposal.
~~AH.21~~	~~Transport for NSW would work with Randwick City Council to identify any parking management measures that would be required to manage kerbside activity within the Randwick and Kensington/Kingsford precincts.~~ **Note: This mitigation measure has been consolidated with mitigation measure AH.20.**
AH.22	The following changes to bus stops would be implemented as part of the CSELR to allow for bus services to service the Prince of Wales Hospital, Children's Hospital and University of NSW: ▪ An indented bus bay for westbound buses on High Street would be introduced adjacent to the adult wing of the Prince of Wales Hospital. ▪ The westbound bus stop on High Street adjacent to the Children's Hospital emergency entrance would be relocated to Clara Street, with access to the hospital via a signalised intersection. ▪ An indented bus bay for westbound buses would be provided on High Street between Botany Street and Wansey Road (within the UNSW site).
AH.23	The off-road shared pedestrian and cyclist path between Darley Road and Wansey Road would be reinstated between the proposed CSELR route and Royal Randwick racecourse. TO BE AMENDED BY PROPOSED CONDITION A.40
AH.24	Sufficient car parking provisions would be provided at the proposed Randwick stabling facility, so that there would be no requirement for CSELR employees to use existing on-street parking when accessing this facility. ATC replacement parking needs to be provided also. TO BE AMENDED BY PROPOSED CONDITION A.29, A.30, A.31, A.32
AH.25	A 3.5 metre wide shared bus and light rail running lane~~s~~ would be provided on Anzac Parade between the Kingsford interchange and ~~High Street for normal bus services in the Kensington/Kingsford precinct~~ a location to the north of UNSW (the location where the express buses would re-join the general traffic lanes along Anzac Parade would be determined during detailed design). ~~This would include an additional short bus only~~ lane adjacent to the proposed light rail track on approach to Meeks Street (southbound).
AH.26	One existing signalised pedestrian crossing of Anzac Parade south of Goodwood Street would be relocated to be adjacent to the Carlton Street stop.
AH.27	Within the Kensington/Kingsford Precinct, physical separation would be provided between light rail and general traffic, particularly at locations where right turns off Anzac Parade were previously permitted but would be prohibited in the future.
AH.28	The existing on-road shared path along the eastern kerb of Anzac Parade between Moore Park Road and Alison Road in the Kensington/Kingsford Precinct would be retained.
AH.29	Cycle storage facilities would be provided at key bus interchanges such as Rawson Place, Randwick and the Kingsford stop, providing opportunities for cyclists to change mode onto the light rail.
AH.30	Pedestrian crossing facilities across Anzac Parade would be provided to permit safe access to the proposed light rail stops situated within the central median of Anzac Parade.

AH.31	Pedestrian access to the Kingsford stop would be provided via signalised crossings on all approaches to the Nine Ways intersection.
ID No.	**Environmental management measure – operational phase**
~~**AH.32**~~	~~To mitigate the impacts that the introduction of the CSELR proposal would have to existing bus priority along Anzac Parade (due to a reduced cross section available for general traffic and bus priority lanes) the following measures are proposed:~~ ▪ ~~A dedicated city-bound bus only lane would be provided in locations where the cross-section permitted five traffic lanes.~~ ▪ ~~The Kingsford stop would provide direct platform interchange for bus and light rail passengers.~~ ▪ ~~Shared running of bus and light rail movement through the proposed signalised Nine Ways intersection.~~ **Note: This mitigation measure has been superseded by the proposed design change to the UNSW Anzac Parade stop arrangement, as described in section 6.13 of the Submissions Report.**
AH.33	The Operator would develop detailed contingency measures to address issues such as flooding, fallen trees/branches and LRV breakdowns which could impact on the operation of CSELR services, LRVs, customers, infrastructure and/or other modes of transport. These contingency measures would be developed prior to the commencement of CSELR operations. An outline of the preliminary operational contingency measures that would be implemented in the event of such incidents occurring on the CSELR network have been outlined in Appendix J of the EIS.
AH.34	At the Rozelle maintenance depot site, vehicle access to the facility and adjacent commercial properties within the rail corridor would be maintained via the existing driveway located on Lilyfield Road, east of Catherine Street, and the existing internal site access road.
AH.35	Parking for staff vehicles at the Rozelle maintenance depot would be accommodated internally, with approximately 50 parking spaces provided for both staff and visitors. Parking provisions at the depot would be sufficient to accommodate all traffic generated by the maintenance depot to minimise impact on adjacent on-street parking provisions.
~~**AH.36**~~	~~The existing Langton Centre off-street and on-street parking affected by the CSELR proposal would be replaced with a similar number of spaces within the vicinity of the Langton Centre. The final location and number of replacement parking spaces would be determined in consultation with the Langton Centre and City of Sydney. Access to this facility would be maintained at all times.~~ **Note: This mitigation measure has been consolidated with mitigation measure AH.16.**
AH.37	All impacted special kerbside uses (e.g. disabled parking and loading zones) along the CSELR corridor would be replaced on a 'like for like' basis within the local vicinity of existing provision. The detailed implementation of this replacement is being worked through with the two local councils, City of Sydney and Randwick City Council.
AH.38	The CSELR alignment would be designed so as to not preclude the opportunity for on-street parking to be provided (during periods of low traffic demands) within the kerbside lane of the road, where sufficient road space is present, in consultation with RMS, City of Sydney and Randwick City Council.
Noise and vibration	

AI.1	For the Surry Hills Precinct, at locations where the *Rail Infrastructure Noise Guideline* (RING) (EPA 2013) operational noise trigger levels are predicted to be exceeded by more than 2 dB, a detailed investigation of feasible and reasonable noise mitigation measures would be undertaken to minimise the worst-case predicted noise levels. As detailed further in Chapter 13 of the EIS and Technical Paper 11 (*Noise and Vibration*) of the EIS, potential measures to be considered include: ▪ more stringent specification of LRV noise emissions in the procurement process, which would only be recommended following consultation with rolling stock providers to establish whether more stringent noise specifications could feasibly be achieved ▪ higher absorption track forms, including those described in the EIS ▪ speed restrictions to 30 kilometres per hour during the night-time between the Central Railway Station and the Surry Hills stops (with the exception of during special events) ▪ minimising wheel and rail roughness through specifications for CSELR operations, such as maintaining the rail surface (via rail grinding) and train wheel conditions (via a wheel lathe) in accordance with defined acceptance standards ▪ individual property treatments, in the event that the above alternatives are determined as not feasible or reasonable.

ID No.	Environmental management measure – operational phase
	The final form of the proposed mitigation measures would be ~~determined during detailed design~~ documented in the Operational Noise and Vibration Review, as required as part of mitigation measure B.1.
AI.2	Warning bells on LRVs would only be used in the event of emergencies or where the driver considers there is a danger to public safety. Warning bells would not form part of normal rail operations (i.e. they would not be used on approach or departure from stations, or at level crossings).
AI.3	Noise from PA systems at the light rail stops would be controlled to minimise potential impacts at the nearest receptors to the stops. The need for announcements at stops in residential areas would also be reviewed, particularly during the more sensitive night-time period.
AI.4	For the Randwick stabling facility, operational noise mitigation measures would be implemented to meet the NSW *Industrial Noise Policy* criteria. The range of alternative measures to be considered would include: ▪ an acoustic shed across the site, including a six metre noise barrier at the site boundary – which would only be implemented if considered feasible considering potential cost, visual and overshadowing implications ▪ operational measures, such as changes to pre-start practices ▪ changes to times of use of areas/noise sources, for example the wash plant ▪ increased noise attenuation targeting particular sources, for example the wash plant ▪ use of barriers within the site (not just at the site boundary), for example between stabling roads or nearer to other noise sources, such as the site access roads, wash plant and sand plant ▪ use of a partial roof enclosure, potentially in conjunction with a combination of other options. TO BE AMENDED BY PROPOSED CONDITION A.29, A.30, A.31, A.32
AI.5	At the Rozelle maintenance depot, the LRV entry doors would be closed at night-time to mitigate operational noise during the night-time period.
Visual and landscape	
~~**AJ.1**~~	~~Consider the opportunity to combine several above-ground street elements (lighting, traffic signals, overhead wiring etc.) on common use poles to reduce visual clutter and to reduce potential impacts on existing awnings and footpaths, in consultation with the City of Sydney or Randwick City Council as appropriate.~~ **Note: This mitigation measure has been consolidated with mitigation measure C.2.**
AJ.2	Where possible, catenary should be located with consistent pole types and even spacing.
AJ.3	Use semi-mature to mature tree specimens, in accordance with the Transport for NSW '*Vegetation Offset Guide*' (2013d) and the Landscape Strategy (Appendix F of the EIS) to replace the character of those lost on a 'like for like' basis, in consultation with the City of Sydney and Randwick City Council.
AJ.4	Where necessary, reconstruct the Ibero-American Statue Plaza to incorporate all statues and restore its setting in consultation with the City of Sydney.
AJ.5	Incorporate tree planting within the Northcott Estate's northern boundary to reinforce the green edge and filtering effect of trees lost in consultation with Housing NSW.
AJ.6	Redefine the northern edge of Ward Park through a new plaza and tree planting in consultation with the City of Sydney and in accordance with the Transport for NSW '*Vegetation Offset Guide*' (Transport for NSW 2013a) and the Landscape Strategy (Appendix F of the EIS).
AJ.7	Enhance the northern edge of Devonshire Street with tree planting (to mitigate the character of those lost within the Devonshire Street road corridor) in consultation with the City of Sydney and in accordance with the Transport for NSW '*Vegetation Offset Guide*' (Transport for NSW 2013a).
AJ.8	Recreate Wimbo Park, together with the new Olivia Gardens, as a high quality open space. Enhance these areas with mature tree specimens to mitigate the character of those trees proposed to be removed, in consultation with the City of Sydney.
AJ.9	Provide appropriate landscape treatment to the surroundings of the Moore Park tunnel portal in consultation with the Centennial and Moore Parks Trust and City of Sydney.

AJX	Ensure presentation of the ATC boundaries is maintained with established planting & high quality retaining wall treatments for a high quality presentation to the spectator precint.
ID No.	**Environmental management measure – operational phase**
AJ.10	Provide a boulevard of street trees along Anzac Parade to improve the streetscape and extend the ceremonial avenue of street trees.
AJ.11	~~At night the strategy for lighting is to~~ Ensure lighting ~~the project~~ contributes to a safe and legible streetscape. In particular, the lighting required for the proposal would be mitigated as follows: ▪ all lights would be located at a similar level to the overhead catenary system so to minimise the light spill onto adjacent areas ▪ all lights would be directed downwards, with the exception of feature lighting that would always be capped by a surface material ▪ light colour would be designed in response to the surrounding context and be selected to complement the surrounding lighting colour ▪ Australian Standard levels for public safety and CCTV would be used, so no unnecessary lighting would be required to be provided.
AJ.12	Where possible any areas of direct light intrusion (glare and spill) from LRV headlights should be identified and managed.
AJ.13	At stops and stabling areas, cut off and directed light fittings (or similar techniques) should be used to minimise glare and light spill onto private property. The design of street lighting along the route would also consider the sensitive placement and specification of lighting to minimise any potential light spill into residential properties.
Air Quality	
AK.1	Ancillary maintenance service vehicles and equipment would be maintained and operated in accordance with the manufacturers requirements.
AK.2	~~Unnecessary release of air pollutants from~~ Operational practices at the Rozelle maintenance depot and Randwick stabling facility would seek to minimise emissions of air pollutants ~~be avoided~~. TO BE AMENDED BY PROPOSED CONDITION A.31, A.32, B.13, K.6
Hazards and risks	
AL.1	Targeted road safety campaigns would be used in the lead up to the opening of the CSELR and during operation to raise awareness around the operation of LRVs and to promote the safe operation of the proposal. This would focus on raising awareness and promoting safe behaviours in shared zones and at key CSELR crossings.
AL.2	All cables would be buried within ducts and would adhere to all International and Australian electrical standards in terms of distances from surrounding cables (i.e. adjacent high voltage cables require minimum separation in accordance with industry standards).
AL.3	Hazardous material procedures (including procedures for managing spills, and the refuelling and maintenance of vehicles/equipment) would be developed and implemented during the operation of the CSELR proposal to minimise potential for impacts associated with chemical spills and leaks. These procedures would adequately address activities at the proposed Rozelle maintenance depot and Randwick stabling facility, as well as other general maintenance facilities that would occur along the CSELR alignment (such as storage of chemicals for operation and maintenance of LRVs in line with EPA guidelines and legislative requirements).
Socio-economic	
AM.1	Light rail stops would incorporate a high quality urban design that would reflect the precinct in which they would be located to assist in minimising impacts to visual amenity resulting from the provision of the CSELR proposal.
AM.2	Transport for NSW would continue to work with stakeholders to identify potential opportunities to integrate CSELR public domain improvements with other city planning strategies (such as the City of Sydney's other public square projects) to improve access to local community services and further enhance the public domain along the route.

ID No.	Environmental management measure – operational phase
AM.3	Where feasible, the CSELR would incorporate features to maintain the safety of passengers, CSELR employees and the general public. Stops would be designed to be safe and attractive places to wait for CSELR services and would (where feasible and appropriate) incorporate light emitting diode (LED) lighting technology, emergency calling capabilities and CCTV.
AM.4	Within the George Street pedestrian zone, the light rail tracks would be highlighted by either a different material colour, finish, texture or size of paving, so that pedestrians can visually and texturally distinguish between the pedestrian zone and the light rail track zone.
AM.5	Special event organisers would be consulted to determine the nature and extent of existing and planned future events that would require the use of George Street and, thus, would be affected by CSELR operations.
AM.6	Access to local community services and open spaces would be maintained during operation of the CSELR proposal. Consultation with the operators of community services (including local childcare centres and places of worship) would be undertaken to minimise impacts to the access of these facilities.
AM.7	Public open spaces directly affected by the CSELR proposal would be reinstated as soon as possible after construction.
AM.8	Revegetation of the CSELR corridor through the Moore Park Precinct would be undertaken (where required) to assist with integrating the light rail into the parkland vista. Visual connectivity would be maintained across the Anzac Road corridor and the existing AFL training field.
AM.9	Pedestrian movements, signage for passengers, and changes to intersection signalisation associated with accessing the Moore Park stop would be considered during detailed design. This would be undertaken in consultation with relevant property owners and stakeholders.
AM.10	Parks and playing fields within Moore Park would be reinstated to their former condition as soon as possible after construction to minimise disruptions to community activities.
AM.11	CCTV would be used to monitor the Moore Park tunnel.
AM.12	Where possible, urban design measures, such as revegetation along the corridor, would be adopted to neutralise or enhance any impacts to the existing median strips and reinstate the visual amenity characteristic of Anzac Parade.
AM.13	A targeted communication strategy would be developed for University of NSW staff and students to allow for a smooth transition to light rail operations.
AM.14	A targeted communication strategy would be developed to maintain access for businesses in the Kensington and Kingsford town centres.
AM.15	The light rail and stops would be designed to promote interaction with, and facilitate access to/from, neighbouring areas.
AM.16	Informational material advertising the commencement of CSELR operations would be prepared in multiple languages widely spoken by the affected community.