Metro Body of Knowledge

Planning Approval Consistency Assessment Form

SM-17-00000111

Sydney Metro – Metro Body of Knowledge (MBoK)

Assessment Name:	Burwood North TBM support
Prepared by:	AFJV
Prepared for:	Sydney Metro
Assessment number:	AFJV CA18
Type of assessment:	Assessment under EP&A Act 1979, Division 5.2
Version:	Final
Planning approval No. (where relevant):	CSS1 10038 Sydney Metro West Concept and Stage 1
Date required:	January 2024
iCentral number	*SM-23-00013784*

Form information – do not alter

Form number	SM-17-00000111
Applicable to:	Sydney Metro
Document Owner:	Director, Planning Approvals
System Owner:	Executive Director, Environment, Sustainability & Planning
Status:	Final
Version:	4.0
Date of issue:	AUGUST 2023
Review date:	As required

Table of Contents

1. Existing Approved Project

Planning approval reference details (Application/Document No. (including modifications)):			
1. CSSI 10038 Sydney Metro West Concept and Stage 1 (11 March 2021) 2. Modification 1 – Administrative Modification (28 July 2021) 3. Modification 2 – Clyde stabling and maintenance facility (3 June 2022) 4. Modification 3 – Administrative Modification (4 July 2022) 5. Modification 4 – Administrative modification (22 December 2022) 6. Modification 5 - Clyde stabling and maintenance facility – additional mangrove impact (20 September 2023)			
Date of determination:	11 March 2021 Date of modifications: • Modification 1: 28 July 2021 • Modification 2: 3 June 2022 • Modification 3: 4 July 2022 • Modification 4: 22 December 2022 • Modification 5: 20 September 2023	Type of planning approval:	Critical State Significant Infrastructure (CSSI) (EP&A Act Division 5.2)
Relevant background information (including EA, REF, Submissions Report, Director General's Report, MCoA):			
• Sydney Metro West Concept and Stage 1, Environment Impact Statement, April 2020 • Sydney Metro West Concept and Stage 1, Amendment Report, November 2020 • Sydney Metro West Concept and Stage 1, Submissions Report, November 2020 • Sydney Metro West Concept and Stage 1 - Assessment Report (SSI 10038), March 2021 • Sydney Metro West Concept and Stage 1, Conditions of Approval (CoA), released on 11 March 2021 and updated on 28 July 2021 (Modification 1), 3 June 2022 (Modification 2), 4 July 2022 (Modification 3), 22 December 2022 (Modification 4) and 20 September 2023 (Modification 5).			
Description of existing approved project you are assessing for consistency:			

Sydney Metro West (the Concept)
Sydney Metro West (the Concept) would involve the construction and operation of a metro rail line around 24 kilometres long between Westmead and Hunter Street in the Sydney CBD. The key components are expected to include (as described in Chapter 6 of the Environmental Impact Statement (EIS)):
• Construction and operation of new passenger rail infrastructure between Westmead and the central business district of Sydney, including:
  ○ Tunnels, stations (including surrounding areas) and associated rail facilities
  ○ Stabling and maintenance facilities (including associated underground and overground connections to tunnels)
• Modification of existing rail infrastructure (including stations and surrounding areas)			

- Ancillary development.

Sydney Metro West - all major civil construction works between Westmead and The Bays (the approved project)
The Sydney Metro West Project Concept; and all major civil construction works between Westmead and The Bays, including station excavation and tunnelling was determined on 11 March 2021. The scope of Stage 1 of the planning approval process for Sydney Metro West (the approved project) is described in Chapter 9 of the EIS, with the key features including:

- Tunnel excavation including tunnel support activities between Westmead and The Bays
- Station excavation for new metro stations at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock and The Bays
- Shaft excavation for services facilities
- Civil work for the stabling and maintenance facility at Clyde.

To construct the above, the Sydney Metro West Stage 1 is divided into multiple packages, each with their own design and construction scope. The package relevant to this Consistency Assessment (CA) is the Central Tunnel Package (CTP) which involves the design and construction of 11km of twin tunnels and underground station excavations from The Bays to Sydney Olympic Park. The overall design and construction timeframe is approximately 3.5 years from July 2021.

This consistency assessment relates to the Burwood North Station site. The Burwood North Station is described in EIS Section 9.5.7 and requires a northern construction site and a southern construction site. This consistency assessment relates to the northern site only.

The northern construction site covers about 12,900 square metres and is located on Parramatta Road bound by Burwood Road and Loftus Street. This site previously contained commercial and residential properties fronting Burwood Road. The northern construction site is currently being used to excavate Burwood North Station using a cut-and-cover technique and is also being utilised for spoil storage and removal, water supply, water treatment and disposal, material storage as well as office facilities, worker amenities and parking.

2. Description of proposed change which is the subject of this assessment

As described in Section 1 of this CA and Section 9.5.7 of the EIS, the Burwood North Station northern construction site comprises of facilities for spoil storage and removal, water supply, water treatment and disposal, material storage as well as office facilities, worker amenities and parking. Section 9.5.10 of the EIS assumed that the tunnelling support facilities would be provided from The Bays construction site. However, it is proposed that once the Tunnel Boring Machines (TBMs) pass through the Burwood North Station site, then the northern construction site would take on some of the tunnelling support facilities from The Bays. This would include the handling and storage of precast concrete linings segments and the provision of a grout batching plant. The precast concrete lining segments would be delivered to and stored within the existing acoustic shed at the northern site.

These support activities would be required 24 hours as permitted by D27(d). Deliveries to support tunnelling works would be as per D37(d)(iii) with entry and exit limited to Parramatta Road between 10pm and 7am. A site gate on Burton Street and/or Parramatta Road exits will be utilised between 7am and 10pm.

Workers will access the tunnels from Burwood North and The Bays construction sites. Overall the number of workers at Burwood North during the TBM support phase is not expected to be more than during excavations of the station box and cavern.

Refer to Appendix A for a site layout drawing of Burwood North.

Grout plant

The grout batching plant would be located within the existing acoustic shed at the Burwood North Station construction site. The grout plant would operate up to 24 hours to facilitate TBM tunnelling activities.

The grout plant would support two tunnel boring machines and include two silos approximately 17m high, two silos approximately 12m high, two shipping containers with pumps and other supporting equipment. The silos and pumps would have a surface area of approximately 15m by 15m. Refer to Figure 2-1 for an indicative drawing of the grout plant set up. Additional area would be required for walkways, pipes and storage including tanks. The plant would be contained within the acoustic shed and not be visible to nearby receivers.

Figure 2-1 indictive drawing of grout plant

Lights would be set up around the grout plant within the shed so that operators can work safely at night.

Deliveries for the grout plant is dependent on productivity of the tunnelling works. The estimated average frequency is 25 deliveries per week.

Construction of the grout plant is expected to take approximately 3 weeks and will involve delivering and installing the equipment.

Segments delivery and handling

Approximately 70 rings (1 ring is made of 6 segments) would be delivered per day with a frequency of approximately 3 rings per hour. Each truck would carry 1 ring; therefore, an estimated average of 3 trucks would arrive per hour.

The segments would be stored inside the acoustic shed and floor of the station box. The existing gantry crane would be used to move segments within the acoustic shed and a 16t forklift would be used to handle segments in the station box. Multi service vehicles (MSVs) would be used to transport the segments to TBM face.

Deliveries and segment handling would typically occur 24 hours Monday to Friday and dayshift Saturday.

The Burwood North construction programme has been developed to separate activities. Cavern excavation and spoil handling for the cavern would be largely completed prior to the arrival of tunnel boring machines. Other possible activities occurring at the same time as the grout plant and segment deliveries would be concrete works and work within the Burwood North Cavern. Interface and coordination would be managed through team meetings and planning sessions.

Table 1 - Comparison of the proposal with relevant elements of the Approved Project

Relevant elements of the Approved Project	Proposed change
EIS Chapter 6, Table 6-11 includes the following overview of activity for Tunnel excavation: It is anticipated the tunnel boring machines would be launched and supported from two sites, being: • Westmead metro station construction site • The Bays Station construction site. These sites would provide the necessary support for the tunnelling operation including spoil storage and removal, power supply to the tunnel boring machines, fresh air ventilation, grout batching, water treatment and disposal, material storage, office facilities, worker amenities and parking	In addition to Westmead Metro Station and The Bays Station construction sites, Burwood North is proposed as a support site for tunnel boring machines. This proposal does not change the launch and supporting sites at Westmead Metro Station and The Bays Station construction sites.

3. Timeframe

The proposed change would take effect once tunnel boring machines pass through the Burwood North station site, which is likely to be in Q1 2024. The grout plant is proposed to be constructed and start operation in Q1 2024. Installation of the plant would take approximately 3 weeks. The operation of the grout plant and segment handling would be in place until the end of CTP tunnelling works in approximately Q4 2024. Site demobilisation would occur in approximately Q1 2025.

The proposed change does not extend the overall duration of work at Burwood North construction site.

4. Site description

The Burwood North Station comprises two construction sites, a northern construction site and a southern construction site. This consistency assessment relates to the northern construction site only. The northern construction site covers about 12,900 square metres and is located on Parramatta Road bound by Burwood Road and Loftus Street. This site previously contained a number of commercial and residential properties fronting Burwood Road. The site is now an established construction site which is being used to excavate the Burwood North Station. The following activities typically occur on the site; station box excavation, spoil storage and removal, water supply, water treatment and disposal and material storage. The site also accommodates office facilities, worker amenities and parking.

5. Site Environmental Characteristics

The Burwood North Station construction site is located on Parramatta Road and therefore is located amongst an existing commercial corridor. Medium to low density housing is located immediately to the north of the site. Concord Oval is located on the eastern side of Loftus Street. Commercial and residential receivers are located to the west of the site on Burwood Road, with commercial receivers located to the south on Parramatta Road.

The site had been heavily disturbed as part of previous development (prior to construction of Sydney Metro West), and there is no naturally occurring native vegetation present within the construction footprint. Additionally, the site does not contain any sensitive environmental features and the nearest waterway is St Lukes Canal which is a concrete-lined waterway located approximately 230 metres to the east.

6. Justification for the proposed change

The proposed change presents an opportunity to realise a number of environmental and sustainability benefits and associated construction efficiencies, as outlined in Section 7.

7. Environmental Benefit

The precast concrete lining segments are manufactured at a precast facility at Eastern Creek and then transferred by truck to The Bays. Managing the precast concrete lining segments at Burwood North presents a number of potential environmental and sustainability benefits. The key benefits include:

- Reduction in heavy vehicle travel distance for precast concrete linings segments delivery

- Relocating the precast concrete lining segment handling to Burwood North would result in a distance reduction of about 8.7km on the inbound journey and 8km on the outbound journey. Cumulatively this would result in a reduction of about 868km of truck kilometres travelled per day.

- Reduction in the fuel burned/energy consumption as a result of the reduced travel distance
- Reduction in potential traffic impacts as a result of reduced travel distance.

Including a grout plant at Burwood North also presents a potential environmental and sustainability benefit. During TBM operation grout lines would be dropped and flushed out each week between the grout plant and the TBM face. Grout within the lines during this process cannot be used and is wasted. By locating a grout plant at Burwood North to feed the tunnelling operation, the distance between the grout plant and the TBM face would be reduced by about 6.7km and therefore the length of grout lines would be reduced by the same distance. As such, the volume of grout wasted when grout lines are dropped and flushed would also be reduced. The grout lines are cleaned with water and emptied into tanks within the tunnel. This process does not occur on the surface. Reduced distance between the pump and TBM face also reduces energy consumption because the pump does not need to push grout through the full length of the tunnel.

Additionally, moving the tunnelling support operations assessed in this CA to Burwood North once the TBM passes through the site, would allow for works within the tunnel east of Burwood North to occur concurrently with the remainder of the TBM operation to the west. This would reduce program risks and therefore minimise the risk of potential community impacts beyond the current program.

8. Control Measures

Will a project and site specific EMP be prepared?	☐ Yes	Are appropriate control measures already identified in an existing EMP?	☒ Yes
	☒ No		☐ No

9. Conditions of approval / Environmental mitigation measures

Number	Condition of Approval/ Environmental mitigation measure	Discussion on relevance and consistency for proposed change
D35	Work must only be undertaken during the following hours: (a) 7:00am to 6:00pm Mondays to Fridays, inclusive; (b) 8:00am to 6:00pm Saturdays; and (c) at no time on Sundays or public holidays.	Proposed work would occur 24 hours. Work outside the hours in D35 would comply with Condition D37.

D36	Except as permitted by an EPL, highly noise intensive work that results in an exceedance of the applicable NML at the same receiver must only be undertaken: (a) between the hours of 8:00 am to 6:00 pm Monday to Friday; (b) between the hours of 8:00 am to 1:00 pm Saturday; and (c) if continuously, then not exceeding three (3) hours, with a minimum cessation of work of not less than one (1) hour. For the purposes of this condition, 'continuously' includes any period during which there is less than one (1) hour between ceasing and recommencing any of the work.	Highly noise intensive work is not proposed.
D37 (d)	Notwithstanding Conditions D35 and D36 of this schedule work may be undertaken outside the hours specified in the following circumstances: (d) By Prescribed Activity, including: (i) tunnelling (excluding cut and cover tunnelling and surface works) are permitted 24 hours a day, seven days a week; or (ii) concrete batching at the Clyde construction site is permitted 24 hours a day, seven days a week; or (iii) delivery of material that is required to be delivered outside of standard construction hours in Condition D35 of this schedule to directly support tunnelling activities, except between the hours 10:00 pm and 7:00 am to / from the Five Dock and Westmead construction sites and to / from Burwood North construction site using any roads / streets other than directly from Parramatta Road; or (iv) haulage of spoil except between the hours of 10:00 pm and 7:00 am to / from the Five Dock and Westmead construction sites and to / from Burwood North construction site using any roads / streets other than directly from Parramatta Road; or (v) work within an acoustic shed where there is no exceedance of noise levels under Low Noise Impact Work circumstances identified in (b) above, unless otherwise agreed by the Planning Secretary. Note: Tunnelling does not include station box excavation.	Material would be required to be delivered outside of standard construction hours in Condition D35 of this schedule to directly support tunnelling activities. Deliveries between the hours 10:00 pm and 7:00 am to / from Burwood North construction site would only be directly from Parramatta Road. Use of the grout plant would occur 24 hours as part of the tunnelling works.

D39	All reasonable and feasible mitigation measures must be implemented with the aim of achieving the following construction noise management levels and vibration criteria: (a) construction 'Noise affected' noise management levels established using the Interim Construction Noise Guideline (DECC, 2009); (b) vibration criteria established using the Assessing vibration: a technical guideline (DEC, 2006) (for human exposure); (c) Australian Standard AS 2187.2 - 2006 "Explosives - Storage and Use - Use of Explosives" (for human exposure); (d) BS 7385 Part 2-1993 "Evaluation and measurement for vibration in buildings Part 2" as they are "applicable to Australian conditions"; and (e) the vibration limits set out in the German Standard DIN 4150-3: Structural Vibration- effects of vibration on structures (for structural damage for structurally unsound heritage items). Any work identified as exceeding the noise management levels and / or vibration criteria must be managed in accordance with the Noise and Vibration CEMP Sub-plan. Note: The ICNG identifies 'particularly annoying' activities that require the addition of 5 dB(A) to the predicted level before comparing to the construction Noise Management Level.	Feasible and reasonable mitigation measures would be implemented for the proposed activities. Refer to Section 10 Noise and Vibration aspect for more information.
D42	Industry best practice construction methods must be implemented where reasonably practicable to ensure that noise levels are minimised around sensitive land user(s). Practices must include, but are not limited to: (a) use of regularly serviced low sound power equipment; (b) temporary noise barriers (including the arrangement of plant and equipment) around noisy equipment and activities such as rock hammering and concrete cutting; and (c) use of alternative construction and demolition techniques.	Feasible and reasonable mitigation measures would be implemented for the proposed activities. Refer to Section 10 Noise and Vibration aspect for more information.

Will the proposed change be consistent with the conditions of approval?	☒ Yes
	☐ No

10. Impact Assessment – Construction

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
Biodiversity	The proposed change would not involve any additional vegetation clearing. No change from the approved project.	No additional measures.	Y	N	Y	
Water	The proposed change would not change water quality or overall water use for the Project. No change from the approved project.	No additional measures.	Y	N	Y	
Soils and contamination	The proposed change would not involve any ground disturbance. No change from the approved project.	No additional measures.	Y	N	Y	
Air quality	The proposed change would not introduce air quality risks not previously assessed for the approved project. No change from the approved project.	No additional measures.	Y	N	Y	
Noise and vibration	**Sensitive receivers** The main northern construction site is located north of Parramatta Road, near the intersection of Parramatta Road and Burwood Road. Adjacent land uses to this site, fronting Parramatta Road, are mostly commercial businesses with some mixed-use commercial/ residential buildings. North of the northern construction site, residential receivers are on Burton Street, with the nearest backing directly onto the boundary of the construction site. To the north of the site is also St Luke's Church, which is heritage listed.	Feasible and reasonable mitigation measures will be implemented to reduce potential noise impact from the grout plant outside standard construction hours. This will include positioning of the grout plant within the existing acoustic shed and installation of an additional noise shield close to the highest noise source.	Y	N	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	The acoustic environment in all areas is dominated by road traffic noise on the major transport corridors such as Parramatta Road and Burwood Road. **Assessment in the EIS** The EIS assessed noise impacts for 24/7 works in the cavern, station box and southern shaft at Burwood North. Table 67 of the EIS – Technical Paper 2 – Noise and Vibration shows that at Burwood North noise levels at night during excavation at both northern and southern construction sites with acoustic sheds installed were predicted to impact up to 171 receivers (between 1 to 20+ dBA above NML). Additionally, mined cavern works were predicted to impact up to 28 receivers (between 1 to 20 dBA above NML) during the night period with shed doors opened and impacts at 2 receivers when doors are closed. Condition of approval D37 includes activities that can be undertaken outside of approved construction hours 24/7, including tunnelling or work within an acoustic shed where there is no exceedance of the noise levels under Low Impact Work circumstances (as defined in D37), unless otherwise agreed by the Planning Secretary. **Noise assessment** Technical Advice Note – Burwood tunnelling support site (Hutchison Weller, 21028-NV-TN-16-1) has been prepared to assess potential noise impacts of the grout plant operation and segments delivery and handling (Appendix B).					

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	The noise assessment includes cumulative impact of other tunnelling support activities that are not directly subject to this consistency assessment but will occur simultaneously. The noise model included an acoustic shed over the western portion of the station box (which the grout plant would be located within) and assessed noise levels with and without doors open. The model did not include an acoustic lid or panel over the eastern portion of the station box; or a noise shield around the grout pump. With doors open, during the night period, a total of 14 receivers are expected to be impacted having 13 receivers 0-10 dB(A) above NML and 1 10-20 dB(A) above NML. With doors closed the number of impacted receivers reduces to 1 in the 0-10 dB(A) range. Feasible and reasonable mitigation measures will be implemented to reduce potential noise impact from the grout plant outside standard construction hours. This will include installation of a noise shield close to the grout pumps, which are the highest noise source. This measure will reduce the predicted impacts to below NML for all receivers when the door is closed. Grout plant operation and segment delivery will occur within the acoustic shed which will provide noise attenuation. In accordance with NV08 the door of the acoustic shed would be kept closed during the night-time period, where feasible and reasonable.					

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	The proposed change does not include vibration intensive activities and will not contribute to groundborne noise. **Summary** The construction and operation of the grout plant and segment deliveries and handling were not specifically assessed for the Burwood North site in the EIS, however, the noise and vibration impacts associated with the proposed change would be broadly consistent or less than other assessed activities. The proposed change will comply with Condition D37 for work outside the hours specified in Condition D35. **Traffic noise** The EIS assumed there would be 306 traffic movements per day at the Burwood North northern site. When the TBM's pass though the Burwood North site the station box excavation would be largely completed. As such the volume of spoil haulage trucks at Burwood North would be greatly reduced. It is anticipated that the supply of precast concrete lining segments would generate around 140 HV movements per day. Other HV movements to support tunnelling support activities at the site would generate about 10-16 HV movements per day. The total number of HV movements, therefore, would be less than that outlined in the EIS. As such, traffic noise impacts as a result of the proposed change are anticipated to be less than that outlined in the EIS.					

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	Some deliveries are anticipated to be required between 10pm and 7am to support tunnelling activities. During those hours vehicle access would only be to/from Parramatta Road as per D37(d)iii).					
Aboriginal Culture and Heritage	The proposed change would not include any work near heritage items. No change from the approved project.	No additional measures.	Y	N	Y	
Historic Heritage	The proposed change would not include any work near heritage items. No change from the approved project.	No additional measures.	Y	N	Y	
Community and socio-economic	The closest sensitive receivers to the Burwood North site are located on Burton Street, Loftus Street, Parramatta Road and Burwood Road. Receivers include residents, businesses on Parramatta Road and Burwood Road and a place of worship on Burton Street. Community impacts considered for the proposed change are noise, visual amenity, traffic and parking. Refer to those specific aspects within this table for details on potential impact, mitigation and consistency with the approved project. It is anticipated that the proposed change will not increase the impacts beyond those assessed in the EIS. Individual briefings (door knocking) have been undertaken with the nearest sensitive receivers, with no concerns raised to date. Briefings have also been provided to City of Canada Bay and Burwood Council. Further briefings will be held and information provided via letterbox	No additional measures.	Y	N	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	notifications, email updates and a Burwood community newsletter.					
Traffic and transport	As described in the noise and vibration section above, the daily heavy vehicle movements required to support the proposed change are less than that proposed in the EIS and Burwood North Construction Traffic Management Plan (CTMP). Therefore, traffic impacts would be consistent with or less than that outlined in the EIS. There is currently no proposal to change the Burwood North access/egress points or heavy vehicle routes to facilitate the proposed change. In the event this is required in the future this would be addressed via an update to the CTMP. There would be some additional vehicle movements throughout the construction period at the Burwood North station construction site due to tunnelling support activities occurring from Burwood North as opposed to The Bays. These vehicles would have otherwise travelled to The Bays so there is no increase as a whole for the project. Relocating the precast concrete lining segment handling to Burwood North would result in a distance reduction of about 8.7km on the inbound journey and 8km on the outbound journey. Cumulatively this would result in a reduction of about 868km of truck kilometres travelled per day. The reduction in heavy vehicle travel distance for precast concrete linings segments delivery would reduce potential traffic impacts. Overall the number of workers at Burwood North during the TBM support phase will be similar to	No additional measures.	Y	N	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	during excavations of the station box and cavern; therefore, impact to parking is not expected to change as a result of the proposed change. Parking will be managed as per the Construction Parking and Access Strategy (CPAS).					
Waste and resource management	As described in Section 7, the proposed change would result in a reduction in the length of the grout lines by about 6.7km. Each week the grout lines would be dropped and flushed. Grout within the lines during this process is wasted. By locating a grout plant at Burwood North the volume of grout wasted once the TBMs pass through the Burwood North station would be reduced due to the reduced length of grout lines.	No additional measures.	Y	N	Y	
Visual	As the handling of the precast concrete lining segments would occur within the site acoustic shed and station box, this activity would not result in a landscape character or visual amenity impact. The grout plant would be located within the acoustic shed and therefore not impact the visual amenity of the area. The assessment in the EIS considered demolition of existing buildings, removal of trees, installation of acoustic shed (or other acoustic measures), lighting outside covered areas, water treatment plant and heavy vehicle movements. These activities are complete or ongoing and unrelated to the proposed change. The proposed change is unlikely to have more impact on visual amenity than the activities considered in the EIS.	No additional measures.	Y	N	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	Lighting Table 15-38 of the EIS assessed the night-time visual amenity impact rating to be of a 'Minor adverse' level. The existing (pre-construction) lighting environment of the area had a concentration of brightly lit commercial, industrial, retail and medium density residential buildings. Whilst the EIS recognised that works may be visible from Parramatta Road, it was expected that the surrounding area generally has the ability to absorb any lighting impacts (EIS section 15.11.2). Any lighting required around the acoustic shed would be installed in accordance with the principles of Australian Standard 4282-1997 *Control of the obtrusive effects of outdoor lighting* and relevant safety design requirements, in accordance with the VAMP. Lighting would also be oriented to minimise light spill and glare in accordance with the VAMP and REMM LV5.					
Land use and property	The proposed change would not require change in land use or property. No change from the approved project.	No additional measures.	Y	N	Y	
Hazard and risk	The proposed change would not introduce additional hazards or risks not previously assessed for the approved project. No change from the approved project.	No additional measures.	Y	N	Y	
Other	Climate change and emissions As described in Section 7, the distance travelled by HVs for the delivery of precast concrete lining segments would be reduced by about 868km per day. This would result in a reduction of fuel	No additional measures.	Y	N	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	consumed by the project, and a reduction in associated greenhouse gas emissions.					

11. Impact Assessment – Operation

Stage 1 of the planning application for Sydney Metro West (subject of this Consistency Assessment) is for major civil construction work for Sydney Metro West between Westmead and The Bays. Measures to avoid or minimise impacts have been developed only for major civil construction work for Sydney Metro West between Westmead and The Bays– which involves construction only. Impacts applicable to the operational aspects of Sydney Metro West including operation stage environmental mitigation measures are subject to the Sydney Metro West - Rail infrastructure, stations, precincts and operations (Stage 3) planning approval. As the proposed change relates to a change in construction methodology only, operational impacts associated with the proposed change are not anticipated.

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
Biodiversity	No change from the approved project.	No additional measures.	Y	N	Y	
Water	No change from the approved project.	No additional measures.	Y	N	Y	
Soils and contamination	No change from the approved project.	No additional measures.	Y	N	Y	
Air quality	No change from the approved project.	No additional measures.	Y	N	Y	
Noise and vibration	No change from the approved project.	No additional measures.	Y	N	Y	
Aboriginal Culture and Heritage	No change from the approved project.	No additional measures.	Y	N	Y	
Historic Heritage	No change from the approved project.	No additional measures.	Y	N	Y	
Community and socio-economic	No change from the approved project.	No additional measures.	Y	N	Y	
Traffic and transport	No change from the approved project.	No additional measures.	Y	N	Y	
Waste and resource management	No change from the approved project.	No additional measures.	Y	N	Y	
Visual	No change from the approved project.	No additional measures.	Y	N	Y	
Land use and property	No change from the approved project.	No additional measures.	Y	N	Y	
Hazard and risk	No change from the approved project.	No additional measures.	Y	N	Y	
Other	No change from the approved project.	No additional measures.	Y	N	Y	

12. Consistency with the Approved Project

Question	Response
Is the project (including the proposed changes) consistent with the conditions of approval?	Yes. A review of the conditions of approval has been undertaken. The proposed change would be consistent with the conditions of approval.
Is the project (including the proposed changes) consistent with the objectives and functions of elements of the Approved Project?	Yes. The proposed change would be consistent with the objectives and functions of the approved project as a whole. In particular, by reducing the vehicle kilometres travelled for delivery of the precast concrete lining segments and reducing the wastage of grout, the proposed change supports the Sydney Metro West objectives of ensuring value for money and a sustainable and deliverable solution.
Are the environmental impacts of the proposed change consistent with the impacts of the approved project?	Yes. As demonstrated in Section 10, the environmental impacts of the proposed change are consistent with the impacts of the approved project.
Are there any new environmental impacts as a result of the proposed works/project changes?	No. There would be no new environmental impacts as a result of the proposed change. Any environmental impacts can be suitably managed in accordance with the CEMP and subplans.
Are the impacts of the proposed activity/works known and understood?	Yes. The impacts of the proposed works are known and understood, and they can be managed in accordance with the CEMP and subplans.
Are the impacts of the proposed activity/works able to be managed so as not to have an adverse impact?	Yes. The impacts of the proposed change can be managed within the framework of the CEMP and subplans so as to not cause an adverse impact beyond that already assessed and approved.
Would any Conditions of Approval be required to be changed as a result of the proposed change (having regard to the above assessment)?	☐ Yes ☒ No
Is the proposed change/s consistent with the approval (having regard to the above assessment)?	☒ Yes ☐ No

13. Other Environmental Approvals

Identify all other approvals required for the proposed works:	The proposed change would require the Burwood North DNVIS to be updated prior to operation of the grout plant.

14. Recommendation

Based on the above impact assessment, and with reference to the CSSI 10038 planning approval documents listed in Section 1, including the conditions of approval, it is recommended that:

	Tick relevant box
The proposed change has negligible or more than negligible impacts on the environment or community however is consistent with the Approval, including the conditions of approval. The proposed impacts are consistent with those assessed for the Approved Project (i.e., does not trigger a change to the conditions of approval).	✓
The proposed change is not consistent with the Approved Project including the conditions of approval and would be subject to a separate modification application.	
The proposed change is not substantially the same as the Approved Project and is considered a radical transformation. A new planning pathway should be considered.	

Author certification

I certify that to the best of my knowledge this Consistency Checklist: • Examines and takes into account the fullest extent possible all matters affecting or likely to affect the environment as a result of activities associated with the proposed change; and • Examines the consistency of the proposed change with the Approved Project; is accurate in all material respects and does not omit any material information.			
Name:	Sarah Grobler	Signature:	
Title:	Environmental Manager		
Company:	AFJV	Date:	22/01/2024

Assessment Supporting Signature

Application supported and submitted by			
Name:	Yvette Buchli	Date:	23/01/2024
Title:	Director Planning Approvals	Comments:	
Signature:			

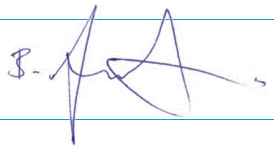
Assessment Endorsement

Based on the above assessment, are the impacts and scope of the proposed change consistent with the existing Approved Project?

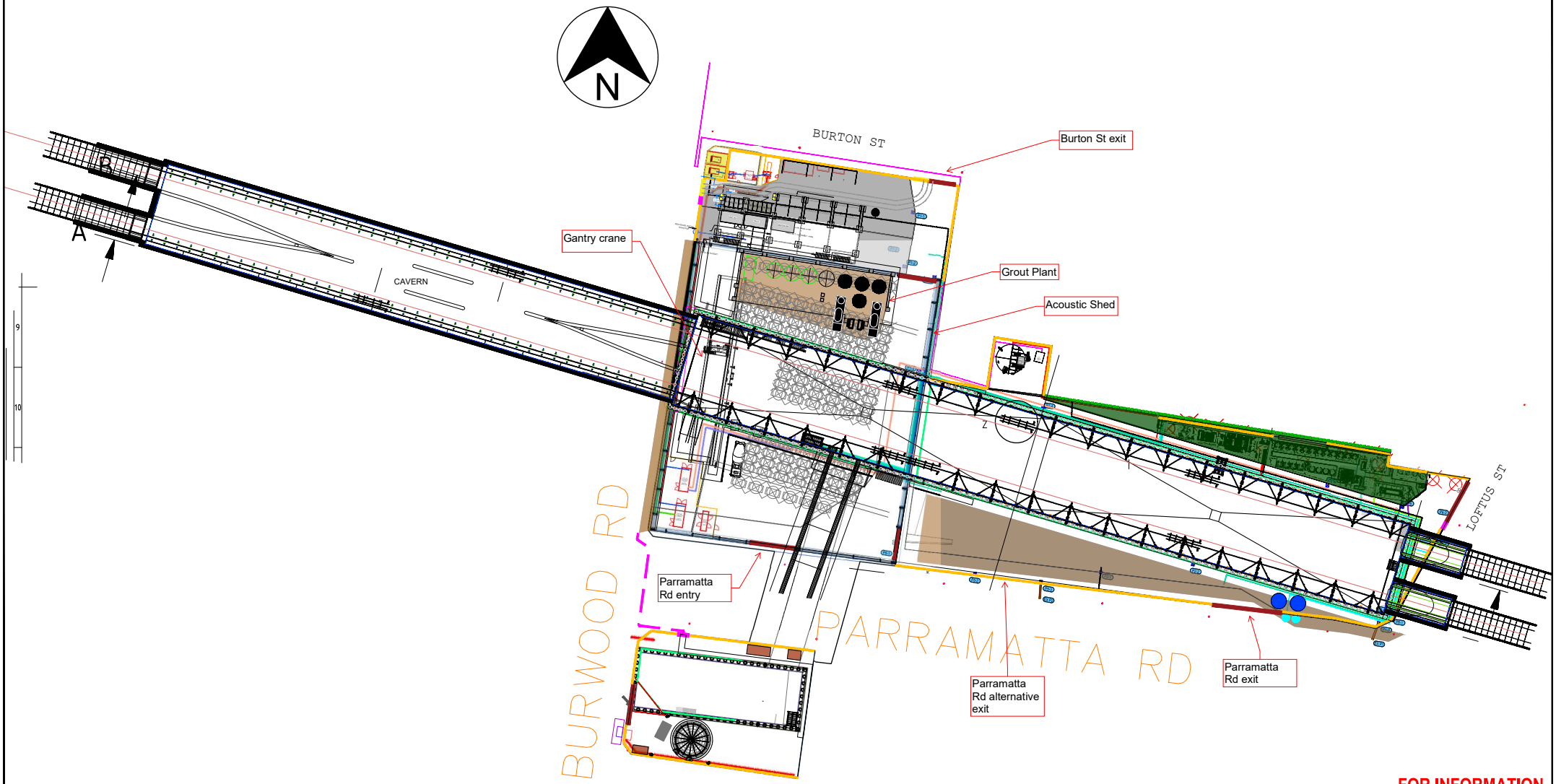
Yes ☒ The proposed change is consistent with the Approved Project and no further assessment is required.

No ☐ The proposed change is not consistent with the Approved Project.

A modification or a new activity approval/ consent is required. Advise Senior Project Manager of appropriate alternative planning approvals pathway to be undertaken.

Endorsed by			
Name:	Ben Armstrong	Date:	25 January 2024
Title:	Director, Project ESP West	Comments:	
Signature:			

Appendix A – Site Layout



FOR INFORMATION

REV.	AMENDMENT DESCRIPTION	Design by	Verified by	Approved by	Date
A 1.3	FOR INFORMATION	JM	BL		02/11/23
A 1.2	FOR INFORMATION	PA	BL		01/11/23
A 1.1	FOR INFORMATION	PA	BL		01/11/23
A 1.0	FOR INFORMATION	JM	BL		30/10/23

SCALE: AS SHOWN

5 0 5 10 15m

1 : 500 FULL SIZE A1

A1 Original | Co-ordinate System: GDA2020/MGAZONE 56 | Height Datum: AHD | This sheet may be prepared using colour and may be incomplete if copied | NOTE: Do not scale from this drawing.

CLIENT: NSW GOVERNMENT | sydney METRO

afJV ACCIONA FERROVIAL JOINT VENTURE

DRAWN	JOSE MARTINEZ	02/11/2023
DESIGNED		
DRG CHECK	BISHOY LUKE	02/11/2023
DESIGN CHECK		
APPROVED		

WORK IN PROGRESS

SYDNEY METRO WEST

BURWOOD NORTH

SITE LAYOUT

MINE TUNNEL

TBM TRAVERSE - PLAN CONVEYOR BOOSTER LOCATION

FILE No: | SHEET: 1 OF 1 | ©

STATUS: | EDMS No:

DRG No: SMWSTCTP-AFJ-SWD-CO300-CX-DRG-612216 | REV A | VER 1.3

Plot Date & Time: 02/11/23 - 10:42

100mm AT FULL SIZE

File Path: C:\pw_acs_smw\jose.martinez\dms100145\SMWSTCTP-AFJ-SWD-CO300-CX-DRG-612216.dwg

Title block Revision: v6.1

Appendix B – Technical Advice Note

Technical Note

Technical Advice Note- Burwood tunnelling support site

Project	Sydney Metro West – Central Tunnelling Package
Client	Acciona Ferrovial Joint Venture

9 January 2024 21028-NV-TN-16-1

1 Introduction

Acciona Ferrovial Joint Venture (AFJV) is delivering the Central Tunnelling Package (CTP) of the Sydney Metro West project.

As part of the assessment of noise and vibration generating impacts for the project, a review of tunnelling support activities has been completed for the Burwood North tunnelling support site during the tunnelling phase of the project.

While the Burwood site has previously been assessed for various construction scenarios, the final phase of site operations supporting TBM tunnelling activities is yet to be approved in the DNVIS.

This technical note provides a preliminary assessment of impacts for the ongoing support activities associated with segment deliveries and the grout plant required for 24 hour operations of the site.

The outcome of this assessment is compared to the predicted levels for similar activities in EIS. Although there are no comparable assessment scenarios for tunnelling support in the EIS, analogous situations are presented in this technical note to demonstrate consistency with the approval.

2 Activity specific assessment

Long term activities to support tunnelling will be undertaken 24 hours a day seven days a week. The EIS notes justification of tunneling works including cross passages and support activities outside standard construction hours, which includes:

- Need to install ground support systems immediately following excavation
- Need to construct cross passages closely following the progress of the TBMs to provide a critical secondary egress for people to evacuate and access for emergency services in the event of an incident
- Reducing peak demand on the electricity network
- Need to handle the spoil produced by the 24/7 operation of the tunnel boring machines and the proposed out of hours transport of spoil

The consideration of support activities for this consistency assessment will include 24/7 activities as follows:

- Deliveries of tunnel segments and operation of the grout plant inside the acoustic shed.
- Operations spoil handling system within the station box;
- Deliveries of material and equipment through the completed TBM tunnels as necessary;

TBM traverse, maintenance and relaunch are temporary activities at the Burwood site that will be assessed separately within the Burwood DNVIS.

Assessment methodology

A SoundPlan noise model incorporating the proposed works has been developed for the OOHW activities. The noise model was used to calculate noise impacts in accordance with the ISO9613 prediction method at all identified noise-sensitive receivers. The model included:

- Topography – 1 metre DEM based on LPI Lidar data.
- Ground absorption factors between source and receivers – hard areas such as concrete are taken as a factor of 0 and absorptive sources such as suburban areas are taken as 0.5.
- Individual buildings for façade calculations and to account for shielding and reflections. Building heights are also taken from Lidar data.
- Individual sensitive receivers – One receiver location representing each residential dwelling and located 1.5 metres above most affected floor level (e.g. level 2) and most-affected facade at up to around 600 metres radius.
- Construction noise sources –Equipment included in the noise model are either point, line or area sources representative of the discreet activities.
- Meteorology –worst-case conditions: gentle breeze (3-5 m/s) source to receiver and stable conditions (conducive of temperature inversion).

Predicted noise levels for each of the locations were compared to the relevant project NML. Where exceedances were identified, additional mitigation may be required to reduce impacts to below the NML.

The model included an acoustic shed over the western portion of the station box with and without doors open. The model did not include an acoustic lid or panel over the eastern portion of the station box.

All assessment assumptions and predictions will be verified during commissioning and initial operation of the tunnelling support activity.

Project-specific construction noise management levels

Individual sensitive receivers for the Burwood site are detailed in the Burwood DNVIS. In general, the main northern construction site is located north of Parramatta Road, at the intersection of Parramatta Road and Burwood Road. Adjacent land uses to this site, fronting Parramatta Road, are mostly commercial businesses with some mixed-use commercial/ residential buildings. Receivers located south of Parramatta Road are represented in the noise catchment area, NCA13.

North of the main construction site, residential receivers are primarily situated on Burton Street, with the nearest dwellings backing directly onto the northern boundary of the construction site. On the northern side of Burton Street is St Luke's Church, which is heritage listed. Receivers north of Parramatta Road are represented by NCA 12.

The two noise catchment areas described have an acoustic environment dominated by road traffic noise on the major transport corridors of Parramatta Road and Burwood Road. Project specific NMLs for residential receivers around the Burwood site are summarised in Table 1 for each of the NCA's.

Table 1 Noise management levels – residential receivers

NCA	Noise Management Level, $L_{Aeq\ 15\ minute}$						
	Approved hours		Outside approved hours				
	Noise affected	Highly noise affected	Day	Evening	Night	Sleep disturbance (CNVS)	
						$L_{Aeq,\ 15\ minute}$	L_{Amax}
NCA12	53	75	48	48	47	47	57
NCA13	58	75	53	53	49	49	59

Equipment noise levels

Activities included for this assessment include operation of the grout plant and deliveries of segments and moving materials/equipment within the acoustic shed. Within the station box, the operation of the conveyor and booster system will be operational 24/7. Deliveries of people and materials to the TBM would also utilise the station box area as necessary.

All equipment used during the activity is assumed to be in constant use except for the MSV which would be used intermittently. The SWL used in the assessment of noise impacts are presented in Table 2.

Table 2 Summary of equipment SWL

Plant/Equipment	Qty	Usage	Equipment SWL dB(A)	
			$L_{Aeq,15\ minute}$	L_{AMax}
Acoustic Shed				
Grout plant (grout pump)	2	1	110	112
Delivery truck	1	1	102	108
Gantry Crane	1	1	102	104
Station Box				
Conveyor (per metre)	190	1	72	75
Booster	2	1	102	105
MSV	2	0.1	105	108

3 Assessment of impacts

Proposed equipment in Table 2 was modelled for 24 hour operations with individual noise sources for each location.

Modelled noise levels for Burwood North tunnelling support completed for the approved Project indicate that the combined impact of operations within the station box and acoustic shed will be greatly reduced when compared to the EIS predictions.

With doors open, during the night period, a total of 14 receivers are expected to be impacted having 13 receivers in the 0-10 dB(A) above NML and 1 in the 10-20 dB(A) ranges. With doors closed the number of impacted receivers reduces to 1 in the 0-10 dB(A) range.

Figure 1 and Figure 2 present the noise contour maps of tunnelling support operations for shed doors open and shed doors closed respectively.

Where practical a local enclosure would be installed around the grout pumps, which are the highest noise source to reduce the predicted impacts to below NML for all receivers when the door is closed. The noise models included in Figure 1 and Figure 2 do not include the proposed noise shield. Verification monitoring will be undertaken during grout plant operation to test the effectiveness of the noise shield.

Consistency assessment

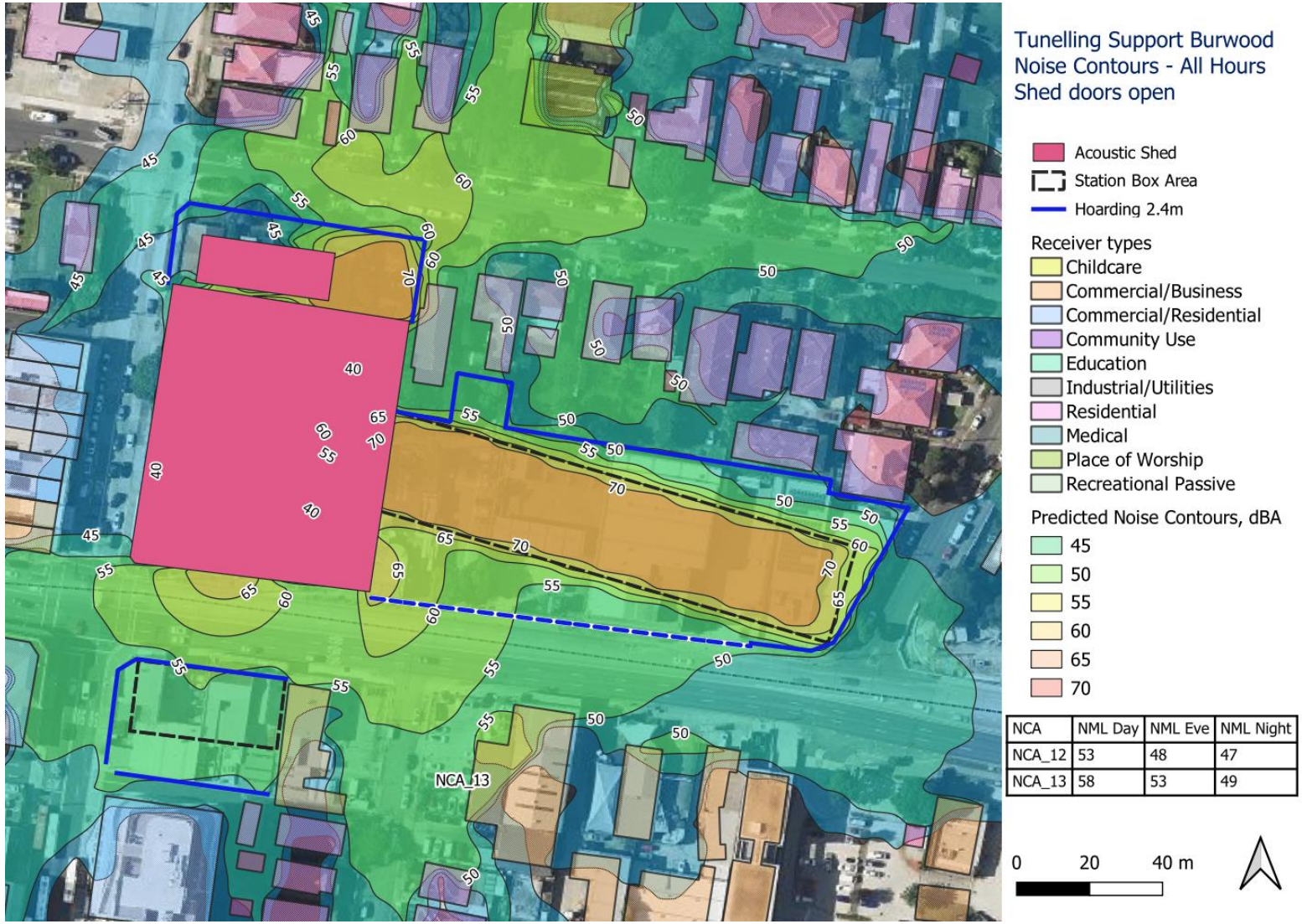
The EIS assessed noise impacts for 24/7 works in the cavern, station box and southern shaft at Burwood North.

Table 67 of the EIS – Technical Paper 2 – Noise and Vibration, shows that at Burwood North noise levels during excavation at night at both northern and southern construction sites with acoustic sheds installed were predicted to impact up to 171 receivers (between 1 to 20+ dBA above NML), with doors open.

Additionally, mined cavern works were predicted to impact up to 28 receivers (between 1 to 20 dBA above NML) during the night period where shed doors are opened and impacts at 2 receiver locations when doors are closed.

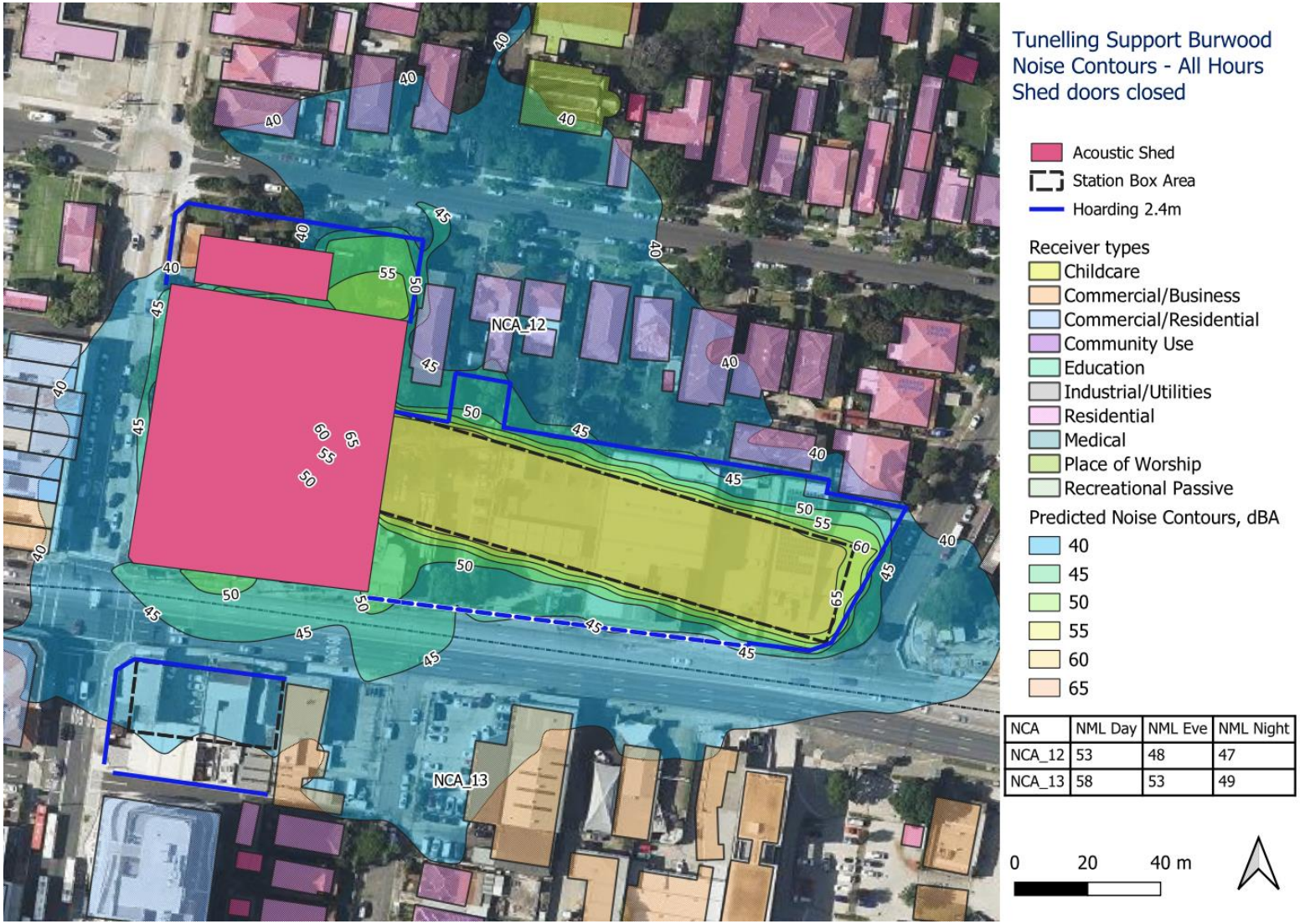
Noise modelling for the tunnelling support indicates that the predicted noise impacts are consistent with or better than the quantum of impacts assessed in the EIS modelling.

In accordance with NV08 the door of the acoustic shed would be kept closed during the night-time period, where feasible and reasonable.



NCA	NML Day	NML Eve	NML Night
NCA_12	53	48	47
NCA_13	58	53	49

Figure 1 Predicted noise levels at 2m height – Shed doors open



NCA	NML Day	NML Eve	NML Night
NCA_12	53	48	47
NCA_13	58	53	49

Figure 2 Predicted noise levels at 2m height – Shed doors closed