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TM372-02-1-03F11 SMW-ETP_ADD_DNVIS-HUN-TBM Retreival OOHW (r3)

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Sydney Metro West Eastern Tunnelling Package - Addendum Detailed Noise and Vibration Impact Statement - Hunter Street Station (Tower Crane Assembly, Disassembly and TBM Retrieval)

1 Introduction

A Detailed Noise and Vibration Impact Statement (DNVIS) has been prepared for the **ETP Hunter Street Station** surface worksites [1](the Hunter Street Station DNVIS). The DNVIS was prepared on behalf of John Holland CPB Contractors Ghella Joint Venture (JCG) to meet the requirements of Planning Approval (SSI 19238057) Condition D29 and the *Sydney Metro Construction Noise and Vibration Standard* (CNVS)[2] for the construction of the Sydney Metro West – Eastern Tunnelling Package (ETP) Works.

This Addendum DNVIS has been prepared consistent with the Hunter Street Station DNVIS to assess changes in the scope of works assessed in the DNVIS.

1.1 Changes to DNVIS assessed in this Addendum

This Addendum DNVIS assesses potential noise and vibration impacts from the retrieval of Tunnel Boring Machines (TBMs) at Hunter Street Station East. Table 1-1 summarises the proposed changes to the activities described in the Hunter Street Station DNVIS.

Table 1-1: Changes to construction works addressed in this DNVIS Addendum

Site	Change to construction works	Change to DNVIS?	Comment
Hunter Street East	TBM retrieval during standard hours and out-of-hours (OOH) work periods.	Yes	Additional activities not included in the Hunter Street Station DNVIS Table C1-2 are outlined in Section 2 and Table C1 in APPENDIX C.
Hunter Street West	TBM retrieval activities only occur at Hunter East. No change to activities at Hunter Street West.	No	Hunter Street Station DNVIS Table C1-1 assumptions remain unchanged.

2 Construction works and hours

2.1 Construction works addressed in this Addendum DNVIS

2.1.1 Location of works

The works assessed in this addendum DNVIS include the works for the dismantling and retrieval of the TBMs at the Hunter Street East Site. The activity comprises four main phases: (i) tower crane footings; (ii) tower crane establishment; (iii) dismantling and demobilisation of the TBM; and (iv) tower crane demobilisation. Each phase involves works being carried out in work areas on the surface, on the Hunter Street East platform, as well as on O'Connell Street and Hunter Street; and at the bottom of the Hunter Street East shaft.

The work areas figures are shown in plan view in Figure 2-1, Figure 2-2 and Figure 2-3 show the work areas in South-West to North-East, and South-East to North-West cross sections of the Hunter Street East shaft, respectively.

2.1.2 Construction works

The additional works assessed in this addendum DNVIS will be undertaken during both standard hours and OOH periods. The works are summarised in Table 2-1.

Table 2-1: Summary of construction works under this addendum DNVIS

Activity/ work area	Aspect	Construction hours	Applicable CoA/ EPL Condition	Timing of activity	Duration
Eastern worksite					
TBM Retrieval	Phase 1 - Tower Crane Footings	Standard hours + OOHW (E/N)	CoA D23(c)	Nov 25	3 weeks
	Phase 2 - Tower crane establishment	Standard hours + OOHW (E/N)	CoA D23(c)	Nov 25	2 weeks
	Phase 3 - Breakthrough and demobilisation of TBMs	Standard hours + OOHW (E/N)	CoA D23(d) EPL L5.10	Dec 25	3 months
	Phase 4 - Tower crane demobilisation and handover[1]	Standard hours + OOHW (E/N)	CoA D23(c)	March 26	2 weeks

Notes:

1. During Phase 4, the tower crane is proposed to be used for no more than one day. To assess the realistic impacts of the activity, Phase 4 has been broken up into two scenarios, one with the tower crane active, and one without.

Figure 2-1: Hunter Street East – Construction Work Areas Plan View

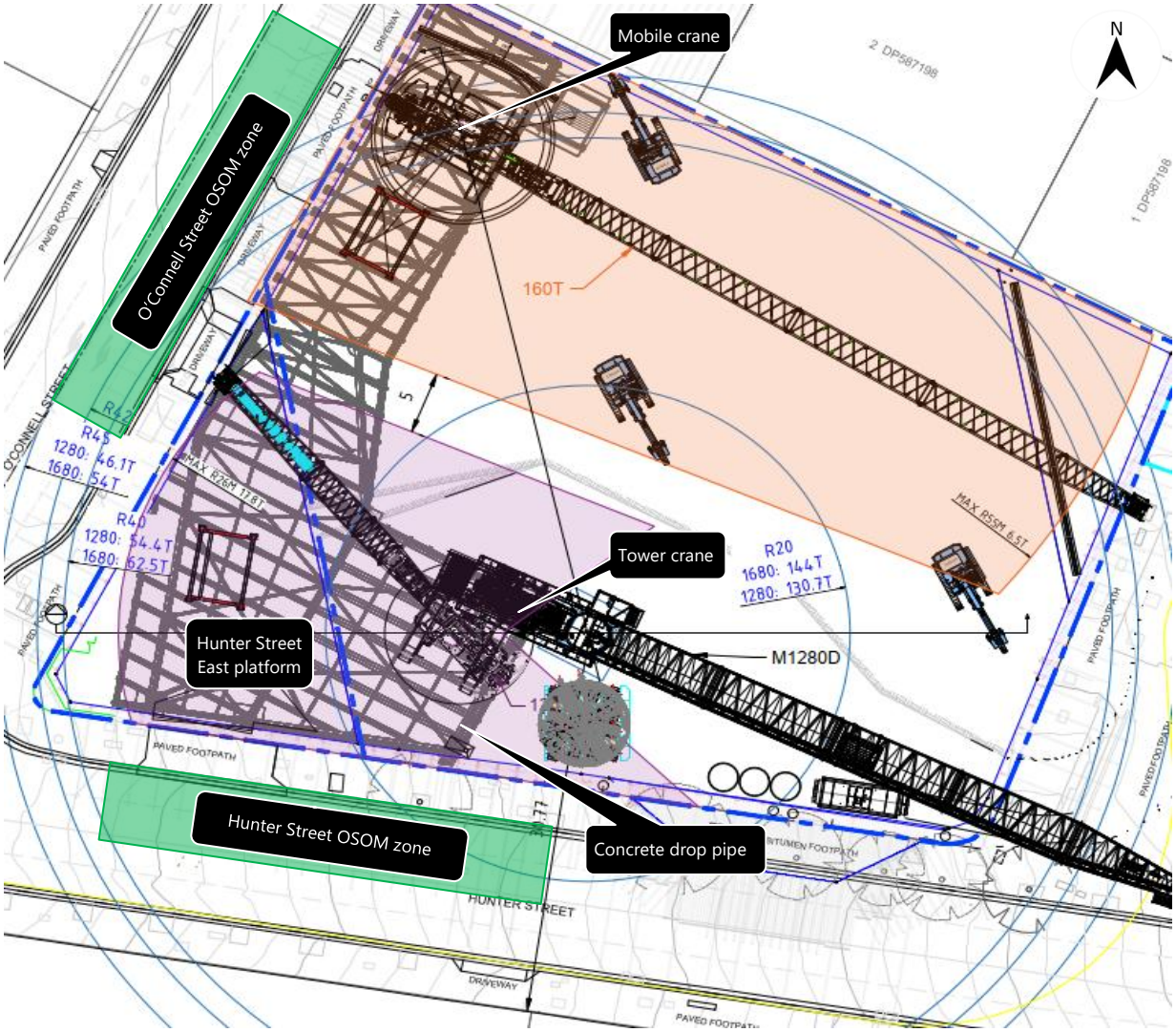


Figure 2-2: Hunter Street East – Construction Work Areas South-West to North-East Cross Section

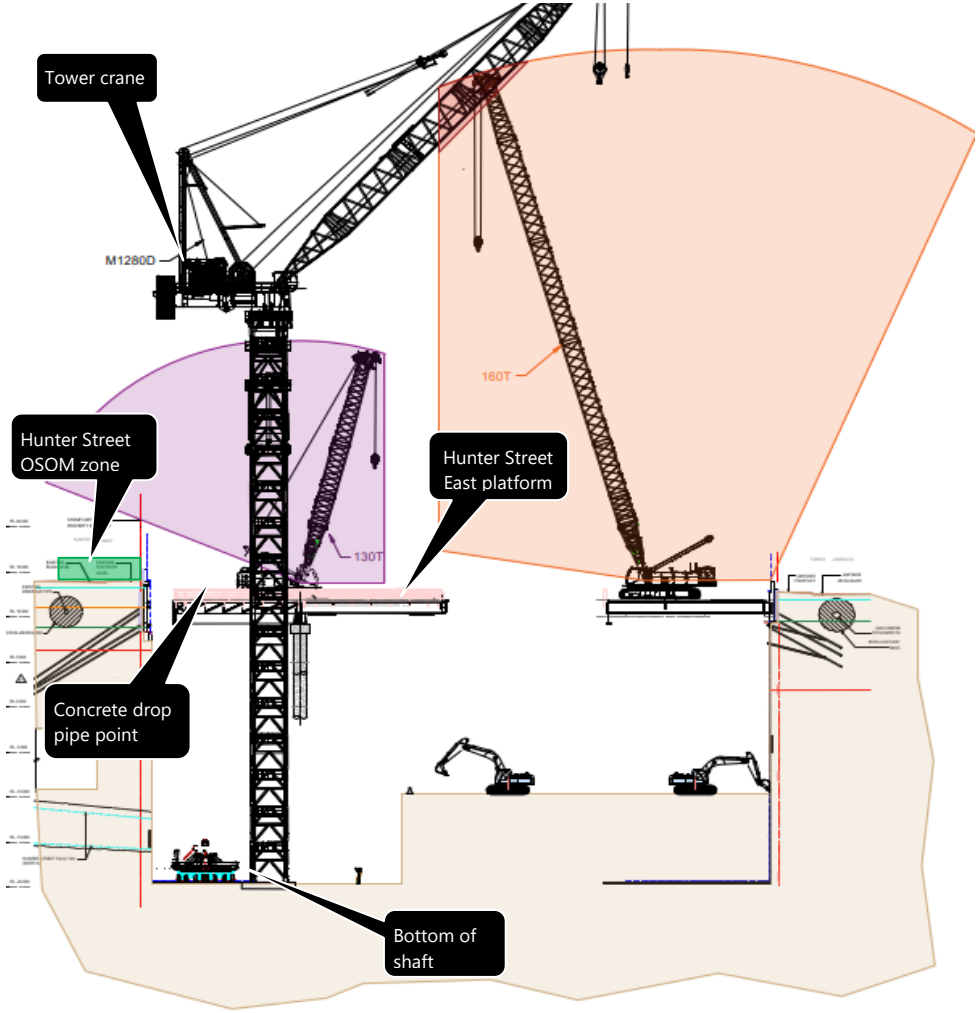
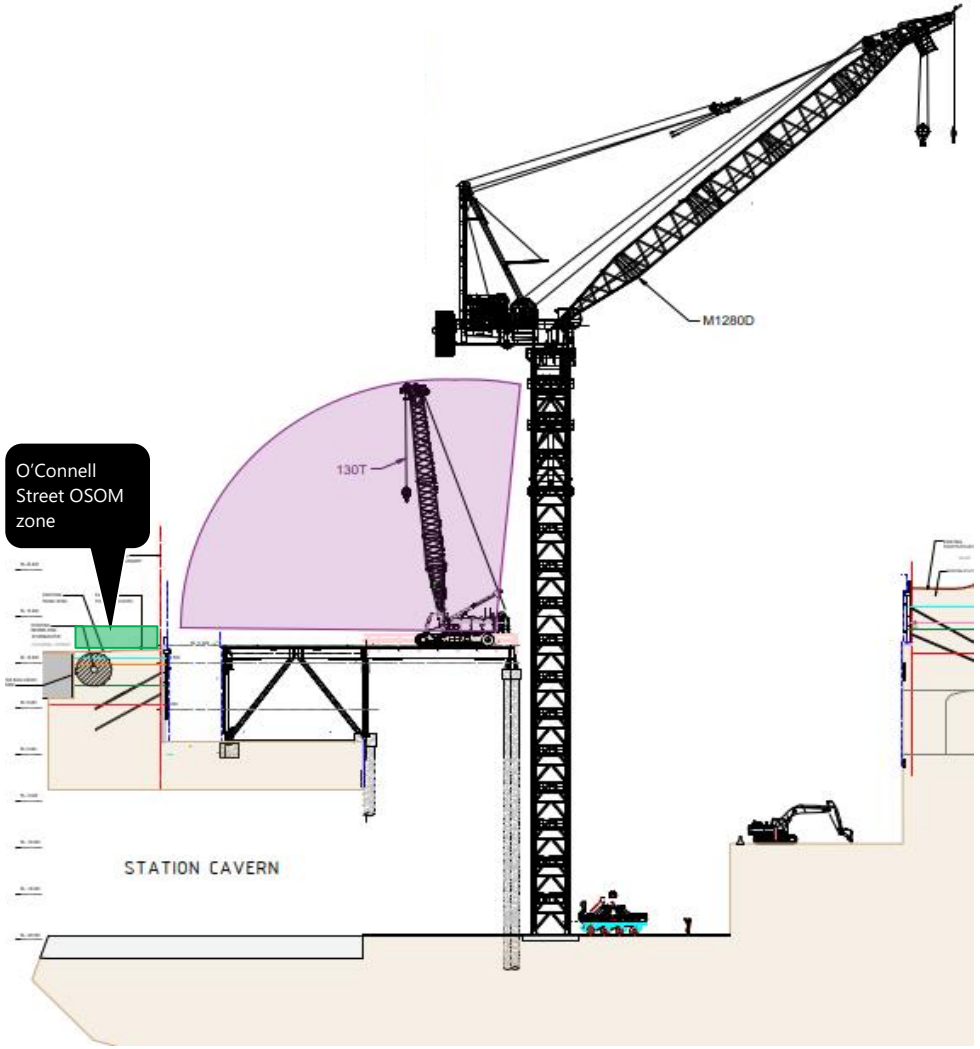


Figure 2-3: Hunter Street East – Construction Work Areas South-East to North-West Cross Section



2.1.3 Construction traffic

No new construction traffic routes are proposed for the scope of works addressed in this addendum DNVIS. Based on the proposed activities presented in Table C1 in APPENDIX C, the construction traffic is consistent with what was assessed in the Hunter Street Station DNVIS. No further assessment is required.

2.1.4 Ground-borne noise and vibration

There are no new vibration intensive activities required for these works. Ground borne noise and vibration impacts from the TBM itself are assessed in the DNVIS prepared for Tunnelling and works with the drilling rig in the Hunter Street DNVIS. No further assessment is required.

2.2 Construction Hours

Construction hours are as reported in the Hunter Street Station DNVIS Section 2.2. The TBM retrieval at Hunter Street Station East will be undertaken during standard hours and out of hours (OOH) work periods.

2.3 Justification for OOHW

The TBM demobilisation works will be undertaken 24 hours per day, 7 days per week (24/7) and will include the following phases/activities:

- Phase 1: tower crane footing (3 weeks)
- Phase 2: tower crane establishment (2 weeks)
- Phase 3: breakthrough and demobilisation of TBM's (3 months)
- Phase 4: tower crane demobilisation.

The works will take place at Hunter Street East worksite and will take approximately 19 weeks.

A variation to the Environmental Protection Licence (EPL) is being sought to permit the works between 10pm and 7am.. If approved, the works will be completed under conditions D23(c) and D23(d) for TBM disassembly and retrieval.

Completing the TBM retrieval works during and outside of standard hours at the Hunter Street East worksite will allow for the maintenance or reduction of the overall program. TBM retrieval is a crucial part of the tunnelling works and have been identified as a 24/7 activity under the Project's Environmental Impact Statement (EIS) (refer to Sections 5.6.3 and 7.3.3). Undertaking the activities 24/7 would contribute to an earlier completion of these discrete works which would result in a reduction in the overall duration of impact to receivers surrounding these sites.

The TBM components will be disassembled within the Hunter Street Cavern and then transported to the bottom of Hunter Street shaft, lifted to surface and transported off site. Given the weight and width of some TBM components, some loads will be lifted and transported off site via over-size and over-mass delivery trucks (OSOM), which will require lane closures subject to approval by the Local Traffic Committee. These works must be undertaken outside of standard construction hours as a requirement of the road authority and will result in less disruptions to the general public, local community and road users.

Over-size, over-mass (OSOM) delivery trucks are required during Phase 2 for mobilisation of the cranes and Phase 3 to take the TBM components off site. The trucks will be unloaded and loaded on Hunter Street and/or O'Connell Street and will require lane closures to allow the works to be completed safely.

OSOM delivery trucks are required for Phase 4 demobilisation of the tower crane at Hunter Street East. The trucks will be unloaded and loaded on Hunter Street and/or O'Connell Street and will require lane closures to allow the works to be completed safely. This will be completed under condition D23(c) and Environmental Protection Licence (EPL) condition 5.14(b).

3 Construction noise and vibration objectives

The Hunter Street Station DNVIS Section 3 describes the Land Use Survey and Noise Catchment Areas used to identify sensitive receivers potentially impacted by the Project and establish receiver groups for the purpose of assessment and management of impact.

Construction noise and vibration objectives are detailed in the CNVS Section 2. A summary of the objectives as applicable to the Hunter Street Station works is provided in Table 4.1 of the Hunter Street Station DNVIS. Construction noise objectives specific to these works are presented in Table B1 in APPENDIX B of this report.

4 Construction noise and vibration assessment

4.1 Construction activities and work areas

The assessed construction scenarios are presented in Table 4-1. Assumptions regarding construction activities, plant and equipment and hours of operation for works assessed in this Addendum are presented in Appendix C.1, and Figure 2-1, Figure 2-2 and Figure 2-3.

Table 4-1: Assessed construction scenarios

Construction activity	Scenario ID	High impact item	Vibration significant item
Eastern worksite			
Phase 1 – Tower Crane Footings	HE-TCF	Road Saw	Drill Rig
Phase 2 – Tower Crane Establishment	HE-TCE	-	-

Construction activity	Scenario ID	High impact item	Vibration significant item
Phase 3 – TBM Demobilisation	HE-TBMD	-	-
Phase 3 – TBM Demobilisation (with attenuated tower crane)	HE-TBMD-A		
Phase 4 – Tower Crane Demobilisation (no tower crane)	HE-TCD	-	-
Phase 4 – Tower Crane Demobilisation (with tower crane)	HE-TCD TC	-	-
Phase 4 – Tower Crane Demobilisation (with attenuated tower crane)	HE-TCD TC-A	-	-

4.2 Airborne noise assessment

The airborne noise prediction methodology is consistent with the Hunter Street Station DNVIS (Section 5.1). Airborne noise impacts during construction works have been predicted and compared to the noise management levels (NMLs). A receiver is considered construction noise affected when the predicted construction noise level is above the NML.

Table 4-3 and Table 4-4 present a summary of the number of residential receivers and other sensitive receivers (respectively) likely to be noise affected by the additional activities associated with the works. The tables are colour coded to indicate how much the predicted noise level is above the NML and the corresponding perceived noise impact, based on the CNVS, as noted in Table 4-2.

Table 4-2: Key to the predicted construction airborne noise results tables

Assessment	Time of day	Key			
$L_{Aeq(15min)}$ Residential	Standard hours[1] or Outside standard hours	1-10 dB(A) above NML (light green)	11-20 dB(A) above NML (yellow)	21-30 dB(A) above NML (orange)	>30 dB(A) above NML (purple)
$L_{Aeq(15min)}$ OSR	Standard hours or Outside standard hours	1-2 dB(A) above NML (green)	2-5 dB(A) above NML (light green)	5-10 dB(A) above NML (light yellow-green)	>10 dB(A) above NML (yellow)
Sleep disturbance	Night only	$L_{Aeq,15min}$ above 40 dB(A) or RBL plus 5 dB, whichever is the greater (yellow)		L_{Amax} above 52 dB(A) or RBL plus 15 dB, whichever is the greater (purple)	

Notes: 1. Highly noise affected (HNA) which is greater than 75dB(A) during standard construction hours is shown with **Bold** text and applies to residential receiver buildings only.

4.2.1 Residential Receivers

4.2.1.1 Standard construction hours

The results summarised in Table 4-3 show that no residential receivers are construction noise affected by the TBM retrieval works during standard construction hours.

From review of the Hunter Street Station DNVIS, the TBM disassembly and retrieval works will be concurrent with the Stage 2 tunnel lining works and Stage 2 shaft excavation and support works. Predicted construction noise from the TBM retrieval works is around 10 dB or more below the predicted noise levels from the Stage 2 shaft excavation and support works during standard hours. The cumulative

impact of adding the TBM retrieval works to the Stage 2 tunnel lining works and shaft excavation and support works assessed in the Hunter Street Station DNVIS is negligible during standard construction hours.

4.2.1.2 Out of hours work

During the night period, Table 4-3 identifies that there is one construction noise affected residential receiver building containing two residential apartments(**16 O'Connell Street Sydney**). The residential receiver is predicted to experience construction noise levels more than the NML when the tower crane is active without attenuation installed (i.e. HE-TBMD, and TE-TCD TC). Other OOH activities occurring at Hunter Street East concurrent with the works will be managed to limit cumulative impacts and ensure respite periods are coordinated to occur concurrently.

Mitigation and management measures summarised in Section 9 of the Hunter Street Station DNVIS will continue to be implemented during the OOH works. Mitigation measures specific to the assessed OOH works (including monitoring requirements) are discussed in Section 4.3.

4.2.1.3 Sleep disturbance

The results summarised in Table 4-3 show that there is one residential receiver building containing two residential apartments (**16 O'Connell Street Sydney**) that may experience construction noise levels above the L_{Amax} sleep disturbance criteria. The works undertaken during Phase 2 and 4 (HE-TCE and HE-TCD) are predicted to be up to 6 dB(A) above the screening limit, caused by powered hand tools on the platform. During Phase 3 and 4 (HE-TBMD and HE-TCD TC), when the tower crane is present without attenuation in place, the predicted L_{Amax} noise levels are up to 7 dB(A) above sleep disturbance screening limit. When the tower crane attenuation is in place (HE-TBMD-A and HE-TCD-TC-A), the L_{Amax} noise levels are controlled by the loading events on O'Connell Street during HE-TBMD-A and the powered hand tools during HE-TCD-TC-A.

Recommendations to limit the risk of sleep disturbance occurring at residential properties are provided in Section 4.3.

Table 4-3: Number of residential receivers over the airborne noise management levels (all NCAs)

Construction activity	Scenario ID	Highly noise affected[1]	Day (standard hours)				Day (outside standard hours)				Evening				Night				Sleep disturbance	
		L_{Aeq}	L_{Aeq}				L_{Aeq}				L_{Aeq}				L_{Aeq}				L_{Aeq}	L_{Amax}
		> 75 dB(A)	1 – 10 dB(A)	11 – 20 dB(A)	21-30 dB(A)	> 30 dB(A)	1 – 10 dB(A)	11 – 20 dB(A)	21-30 dB(A)	> 30 dB(A)	1 – 10 dB(A)	11 – 20 dB(A)	21-30 dB(A)	> 30 dB(A)	1 – 10 dB(A)	11 – 20 dB(A)	21-30 dB(A)	> 30 dB(A)	> 40 or RBL+5 dB(A)	> 52 or RBL+15 dB(A)
Eastern worksite																				
Phase 1 – Tower crane footings	HE-TCF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Phase 2 – Tower crane establishment	HE-TCE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Phase 3 – TBM demobilisation	HE-TBMD	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Phase 3 – TBM demobilisation (with attenuated tower crane)	HE-TBMD-A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Phase 4 – Tower crane demobilisation (no tower crane)	HE-TCD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Phase 4 – Tower crane demobilisation (with tower crane)	HE-TCD-TC	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Phase 4 – Tower crane demobilisation (with attenuated tower crane)	HE-TCD-TC-A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

Note: Construction noise level cells are shaded based upon the predicted worst case NML exceedance in accordance with the key presented in Table 5.2

1. Highly noise affected applies to residential receivers, as per the ICNG (not applicable during the evening or night period).

Table 4-4: Number of other sensitive receivers over the airborne noise management levels (all NCAs)

Construction activity	Scenario ID	Educational[1, 2, 3]				Medical[1, 2, 3]				Recreational[1, 2, 3]				Place of worship[1,2, 3]				Commercial[1, 2]				Hotel/Motel/ Hostel[1,2, 4]				Other[1, 2]			
		L_{Aeq}				L_{Aeq}				L_{Aeq}				L_{Aeq}				L_{Aeq}				L_{Aeq}				L_{Aeq}			
		1 – 2 dB(A)	2 – 5 dB(A)	5-10 dB(A)	> 10 dB(A)	1 – 2 dB(A)	2 – 5 dB(A)	5-10 dB(A)	> 10 dB(A)	1 – 2 dB(A)	2 – 5 dB(A)	5-10 dB(A)	> 10 dB(A)	1 – 2 dB(A)	2 – 5 dB(A)	5-10 dB(A)	> 10 dB(A)	1 – 2 dB(A)	2 – 5 dB(A)	5-10 dB(A)	> 10 dB(A)	1 – 2 dB(A)	2 – 5 dB(A)	5-10 dB(A)	> 10 dB(A)	1 – 2 dB(A)	2 – 5 dB(A)	5-10 dB(A)	> 10 dB(A)
Eastern worksite																													
Phase 1 – Tower crane footings	HE-TCF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	3	0	0	1	0	0	0	0	0	0
Phase 2 – Tower crane establishment	HE-TCE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	0	0	0	1	0	0	0	0	0
Phase 3 – TBM demobilisation	HE-TBMD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	2	5	0	0	1	1	1	0	0	0	0
Phase 3 – TBM demobilisation (with tower crane attenuation)	HE-TBMD-A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0
Phase 4 – Tower crane demobilisation (no tower crane)	HE-TCD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	1	0	0	0	0	0
Phase 4 – Tower crane demobilisation (with tower crane)	HE-TCD-TC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	3	4	0	0	2	0	1	0	0	0	0
Phase 4 – Tower crane demobilisation (with tower crane)	HE-TCD-TC-A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	1	0	0	0	0	0

Note: Highly noise affected does not apply to OSRs, as per the ICNG.

1. Commercial, recreational and other sensitive receivers have been assessed against the respective NMLs (see Table B1 in APPENDIX B), and exceedances have been presented in the count table. 'Other' includes industrial receivers, theatre, television or recording studios. For more detail on specific impacts to receivers refer to Appendix D (Table D.1) in the Hunter Street Station DNVIS
2. Impacts only applicable when facility is in use.
3. Other sensitive receivers are land uses detailed and assessed as per the ICNG Table 3.
4. Non-bracketed values are assessed against the Hotel night NML (interior noise level of 40 dB(A)), bracketed values are assessed against the day and evening NML (interior noise level of 50 dB(A)).

4.2.2 Other Sensitive Receivers

The number of affected receivers shown in Table 4-4 is a summary reflective of the period during which the most other sensitive receivers are affected. For commercial receivers, this is the daytime period, and for hotel receivers this is the night period. Given near all instances of noise impacts on OSRs are less than 10 dB(A) above NMLs, noise impacts on OSRs have been presented with more granular bins in Table 4-4.

4.2.2.1 Standard construction hours

During standard construction hours, there are up to 15 noise affected commercial receivers and one noise affected hotel receiver. The hotel receiver affected is the upper levels of the Paradox Hotel (former Radisson Hotel), where noise levels may be up to 2 dB(A) above the NML during activities involving the tower crane without attenuation in place, being scenarios HE-TBMD, and TE-TCD TC.

4.2.2.2 Out of hours work

Commercial receivers reported as being construction noise affected during OOH periods in Table D1 of APPENDIX D are unlikely to be in use.

During the night period, there are three hotel receivers predicted to be construction noise affected, being **The Grand Hotel**, the **Paradox Hotel** (former **Radisson Hotel)**, and **Sofitel Sydney Wentworth**. Exceedance at these receivers during the night period are as follows:

- The Grand Hotel – up to 1 dB(A) during HE-TCF.
- The Paradox Hotel (former Radisson Hotel) upper levels – up to 6 dB(A) in scenarios where the tower crane is not active, or active with attenuation in place, and 12 dB(A) when the tower crane is active without attenuation.
- The Paradox Hotel (former Radisson Hotel) lower levels – up to 3 dB(A) only in scenarios where the tower crane is active without attenuation.
- Sofitel Sydney Wentworth – up to 1 dB(A) during HE-TCF, and up to 6 dB(A) in scenarios where the tower crane is active without attenuation.

Mitigation and management measures summarised in Section 9 of the Hunter Street Station DNVIS will continue to be implemented during the OOH works. Mitigation measures specific to the assessed OOH works (including monitoring requirements) are discussed in Section 4.3.

4.2.2.3 Sleep disturbance

The results summarised in Table 4-3 show that there is one hotel receiver (**the Paradox Hotel upper levels**), that may experience construction noise levels above the L_{Amax} sleep disturbance criteria caused by the works undertaken at Hunter Street during Phase 2 and 4 (HE-TCE and HE-TCD), where predicted L_{Amax} noise levels are up to 4 dB(A) above sleep disturbance screening limit, caused by powered hand tools on the platform. During Phase 3 and 4 (HE-TBMD and HE-TCD-TC), predicted L_{Amax} noise levels are up to 5 dB(A) above sleep disturbance screening limit when the tower crane is active without attenuation. When the tower crane attenuation is in place (HE-TBMD-A and HE-TCD-TC-A), the L_{Amax} noise levels are controlled by the loading events on O'Connell Street during HE-TBMD-A and the powered hand tools during HE-TCD-TC-A.

Recommendations to limit the risk of sleep disturbance occurring at hotels are provided in Section 4.3.

4.3 Mitigation and management measures

4.3.1 Specific mitigation measures

In addition to the mitigation and management measures outlined in Section 9 of the Hunter Street Station DNVIS, the following specific mitigation measures will be implemented as applicable during the OOH works associated with the TBM retrieval, taking into consideration industry best practice methods in accordance with Planning Condition of Approval D28.

Table 4-5: Specific mitigation measures

Control measure	Description of the control measure	Feasible/ reasonable test	Adopted?
Maintain B-Class Hoarding at Hunter East site	Maintain B-Class hoarding at the Hunter East site.	This measure is feasible, however it limits oversized vehicles getting onto site because height restriction/ gates. Vehicles unloaded on Hunter Street, not reasonable.	No
Limit use of power hand tools after 10pm	The use of power hand tools after 10pm will be limited to use in the bottom of the station box only, where practicable.	This measure could not feasibly and reasonably be implemented as works will be required 24/7.	No
Temporary acoustic enclosures	Drills, grinders and circular saws will be used inside an acoustic enclosure made with noise blankets over a scaffold structure, including a roof after 10 pm. This would reduce noise from cutting/ grinding by approx. 10 dB.	This measure could not feasibly and reasonably be implemented due to spatial constraints.	No
Truck loading/unloading area on site	The loading area used within the site will be selected to ensure the longest path from and/ or obstructions (barriers) between the loading area to the access gate, as much as possible.	This measure will be implemented where site conditions make it practicable	Yes
Access gates closed except to allow vehicles on/off site	The access gate to the worksite is opposite a sensitive receiver site (hotels) for both locations. The solid gate would be opened to allow a vehicle on/off site.	This measure could feasibly and reasonably be implemented.	Yes

Control measure	Description of the control measure	Feasible/ reasonable test	Adopted?
Smooth access driveways	Access driveways to the worksites will be maintained smooth, to minimise the occurrence of clangs or bangs as trucks enter the worksite	This measure could feasibly and reasonably be implemented.	Yes
Management of truck unloading with cranes	Higher levels of instantaneous noise levels can be generated by clangs of chains when unloading equipment from trucks with cranes. Careful securing of equipment to avoid clangs or substituting chains with slings may reduce instantaneous noise levels by up to 10 dB(A).	This measure could feasibly and reasonably be implemented.	Yes
Material staging	Avoid setting material down multiple times when being moved from site onto a truck.	This measure could feasibly and reasonably be implemented.	Yes
Replace diesel powered crane with electric powered	Replacement of the diesel slewing crane with an electric powered crane has been reviewed. There is potential for this to reduce noise levels from the crane by 8-10 dB.	Not feasible. Electric crawler crane does not meet lifting requirements.	No
Install attenuation measures on tower crane	Install internal engine bay cladding, external aluminium noise attenuating baffles, and an additional muffler to the diesel exhaust system on the tower crane.	This measure could feasibly and reasonably be implemented.	Yes
Replace standard manual hammers with rubber mallets	Replacement of standard metal hammers with rubber mallets will reduce noise emission from metal-on-metal contact by approx. 8-10 dB during the night period.	This measure could feasibly and reasonably be implemented.	Yes
Soft slings	Use soft slings where viable to avoid chain on steel contact where possible.	This measure could feasibly and reasonably be implemented.	Yes
Dunnage	Ensure that dunnage such as timber, plastics or rubber is used at set down points to prevent impact noises.	This measure could feasibly and reasonably be implemented.	Yes
Toolbox Talks	Consistent with the DNVIS, toolbox talks should include discussion of managing clangs, bangs and other high instantaneous noise sources (e.g. prevent dropping of steel on ground) during the night period (after 10pm) to minimise noise impacts and limit the risk of sleep disturbance.	This measure could feasibly and reasonably be implemented.	Yes

4.3.2 Attended airborne noise monitoring

Monitoring should be conducted on site to verify the actual noise emissions from the works involving the tower crane and to identify whether mitigation measures can be implemented to reduce construction noise.

As noted in Section 9.6.1 of the Hunter Street Station DNVIS, attended noise monitoring is to be undertaken to verify that noise levels resulting from the TBM retrieval works are in accordance with the levels predicted in this report. Noise monitoring will be completed in publicly accessible areas on or near the nominated receivers, at ground floor level. The nominated monitoring locations are:

Table 4-6: Nominated verification monitoring locations

Type of monitoring	NCA/ Receiver type	Nominated receiver address
Attended/ Real Time	N/A	HSE_NM3 on O'Connell Street Site Boundary (see Figure 4-1)

Type of monitoring	NCA/ Receiver type	Nominated receiver address
Attended/ Real Time	N/A	HSE_NM2 16 O'Connell Street Courtyard (see Figure 4-1)

Figure 4-1 On site noise monitoring location (Hunter Street East)

5 Impact classification

The impact classification from Section 10 of the Hunter Street Station DNVIS has been reviewed taking into consideration the outcomes of this Addendum assessment report. The impact classification for these works is **low to moderate** as works were found to, at times, exceed NMLs for one residential receiver, and several other sensitive receivers. All reasonable and feasible mitigation measures have been incorporated into the site design.

There is no change to the overall noise and vibration impact classification. That is, the overall noise impact of the Hunter Street Station (Stage 1 demolition and Stage 2 excavation) works is considered **low to moderate**. Mitigation measures will be implemented to reduce noise levels with the aim of achieving the NMLs and limit the overall noise impact to **low**. Where this is not feasible or reasonable, residual impacts will be managed as outlined in Section 9.4 of the Hunter Street Station DNVIS.

6 Conclusion

In conclusion, works associated the TBM disassembly and retrieval at Hunter Street Station east worksite have been described in this Addendum DNVIS, to identify potential environmental risks associated with construction noise and vibration. Construction noise and vibration objectives have been established in the Hunter Street Station DNVIS, consistent with the conditions of approval for the Project and the EIS.

The predicted airborne noise levels indicate that one residential receiver will be impacted during the night period when the tower crane is operational. No residential receivers are predicted to be construction noise affected during standard construction hours.

During OOH works, one residential receiver is predicted to experience construction noise levels more than the NML when the tower crane is active without attenuation installed (i.e. HE-TBMD, and TE-TCD TC). Additional mitigation measures will be implemented as outlined in Section 4.3, inclusive of attenuation on the tower crane, which reduces the likelihood of impacts during the OOH periods on the residential receiver.

Other OOH activities occurring at Hunter Street East concurrent with the TBM retrieval works will be managed to limit cumulative impacts and ensure respite periods are coordinated to occur concurrently.

Several commercial receivers and three hotels are predicted to be impacted during standard hours and OOH work periods.

Actual construction noise levels should be verified to determine if construction noise levels exceed NMLs. Mitigation and management measures summarised in Section 9 of the Hunter Street Station DNVIS and specific mitigation measures outlined in Section 4.2.2 of this Addendum report will continue to be implemented during the TBM retrieval activities.

There are no vibration significant plant or equipment proposed to be used during the OOH works. Ground-borne noise and vibration impacts are unchanged from the impacts presented in the DNVIS.

Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Reviewed / Authorised
1/09/2025	Initial issue	0	1	H. Baker	T. Gowen	T. Gowen
3/10/2025	Update following JCG review	1.1	2	H. Baker	T. Gowen	T. Gowen
8/10/2025	Update following JCG review	0	3	H. Baker	T. Gowen	T. Gowen
22/10/2025	Respond to SM/ER/AA comments	3.1		H. Baker	T. Gowen	T. Gowen

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The work presented in this document was carried out in accordance with the Renzo Tonin & Associates Quality Assurance System, which is based on Australian/New Zealand Standard AS/NZS ISO 9001.

This document is issued subject to review and authorisation by the suitably qualified and experienced person named in the last column above. If no name appears, this document shall be considered as preliminary or draft only and no reliance shall be placed upon it other than for information to be verified later.

This document is prepared for the particular requirements of our Client referred to above in the 'Document details' which are based on a specific brief with limitations as agreed to with the Client. It is not intended for and should not be relied upon by a third party and no responsibility is undertaken to any third party without prior consent provided by Renzo Tonin & Associates. The information herein should not be reproduced, presented or reviewed except in full. Prior to passing on to a third party, the Client is to fully inform the third party of the specific brief and limitations associated with the commission.

In preparing this report, we have relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Client and/or from other sources. Except as otherwise stated in the report, we have not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

We have derived data in this report from information sourced from the Client (if any) and/or available in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination and re-evaluation of the data, findings, observations and conclusions expressed in this report.

We have prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

The information contained herein is for the purpose of acoustics only. No claims are made and no liability is accepted in respect of design and construction issues falling outside of the specialist field of acoustics engineering including and not limited to structural integrity, fire rating, architectural buildability and fit-for-purpose, waterproofing and the like. Supplementary professional advice should be sought in respect of these issues.

External cladding disclaimer: No claims are made and no liability is accepted in respect of any external wall and/or roof systems (eg facade / cladding materials, insulation etc) that are: (a) not compliant with or do not conform to any relevant non-acoustic legislation, regulation, standard, instructions or Building Codes; or (b) installed, applied, specified or utilised in such a manner that is not compliant with or does not conform to any relevant non-acoustic legislation, regulation, standard, instructions or Building Codes.

References

[1] Renzo Tonin & Associates 2023 Sydney Metro West Eastern Tunnelling Package - Detailed Noise and Vibration Impact Statement – Hunter Street Station – 24 May 2023 (TM372-02-1-03F01 SMW-ETP_DNVIS-HUN (revB))

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[4] Sydney Metro West Out-of-hours Work Protocol (in progress)

[5] SLR Consulting Australia Pty Ltd 2021 Sydney Metro West - Major civil construction between The Bays and Sydney CBD - Technical Paper 2: Noise and Vibration October 2020

[6] Sydney Metro 2022 Sydney Metro West – Submissions Report - Major civil construction between The Bays and Sydney CBD

[7] Department of Environment and Climate Change 2009 NSW Interim Construction Noise Guideline (ICNG)

[8] Environment Protection Authority 2017 NSW Noise Policy for Industry (NPfI)

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[10] Department of Environment Conservation NSW 2006 Assessing Vibration; a technical guideline

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[12] British Standard BS 6472-2008, Evaluation of human exposure to vibration in buildings (1-80Hz)

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[16] ASHRAE Applications Handbook (SI) 2003, Chapter 47 Sound and Vibration Control, pp47.39-47.40

[17] Australian Standard 2834-1995 Computer Accommodation, Chapter 2.9 Vibration, p16

[18] Australian Standard AS/NZS 2107:2000 Acoustics - Recommended design sound levels and reverberation times for building interiors

APPENDIX A Glossary of terminology

The following is a brief description of the technical terms used to describe noise to assist in understanding the technical issues presented.

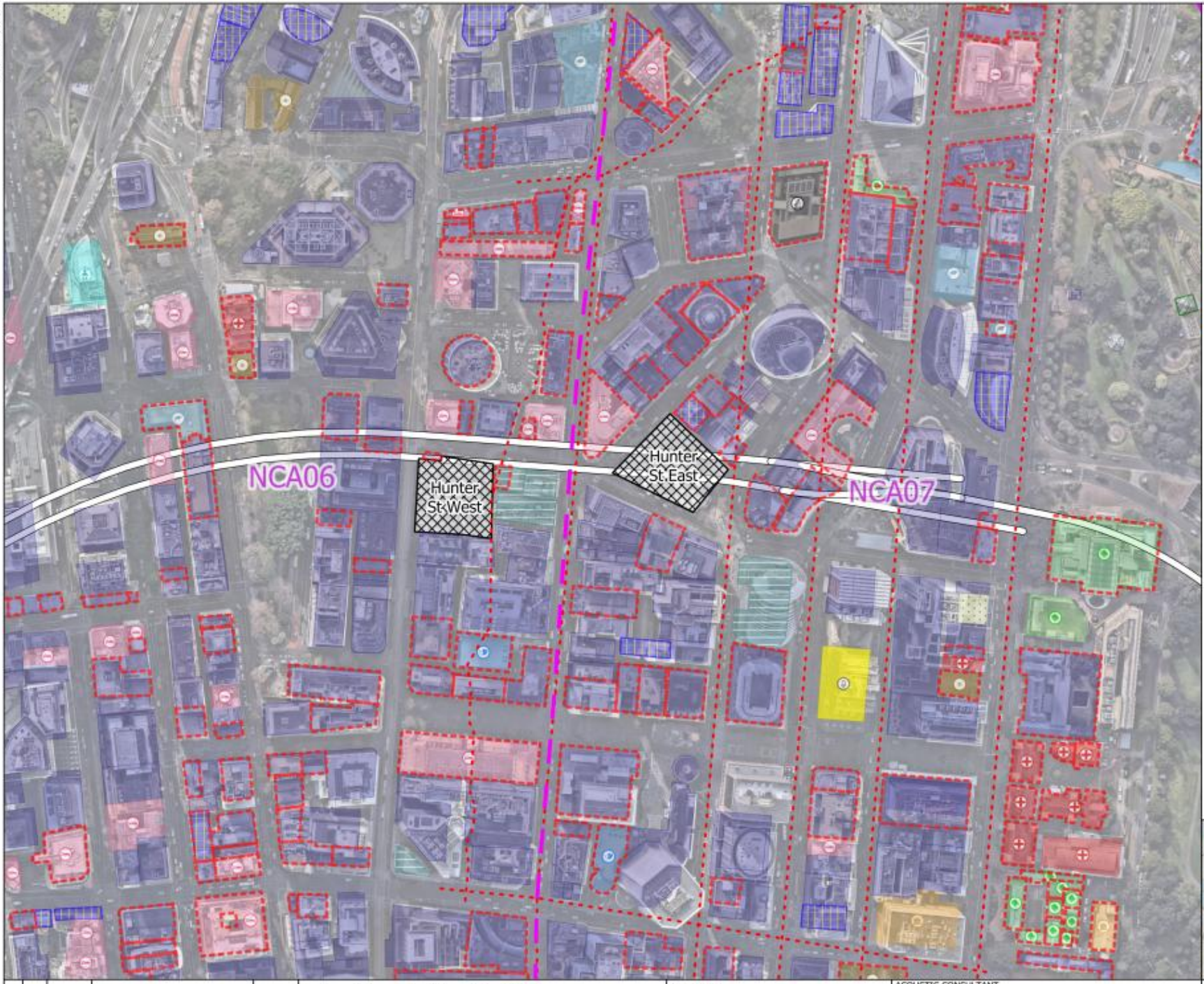
Adverse weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
Assessment period	The period in a day over which assessments are made.
Assessment point	A point at which noise measurements are taken or estimated. A point at which noise measurements are taken or estimated.
Background noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L90 noise level (see below).
Decibel [dB]	The units that sound is measured in. The following are examples of the decibel readings of every day sounds: 0dB The faintest sound we can hear 30dB A quiet library or in a quiet location in the country 45dB Typical office space. Ambience in the city at night 60dB CBD mall at lunch time 70dB The sound of a car passing on the street 80dB Loud music played at home 90dB The sound of a truck passing on the street 100dB The sound of a rock band 115dB Limit of sound permitted in industry 120dB Deafening
dB(A)	A-weighted decibels. The A- weighting noise filter simulates the response of the human ear at relatively low levels, where the ear is not as effective in hearing low frequency sounds as it is in hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter.
dB(C)	C-weighted decibels. The C-weighting noise filter simulates the response of the human ear at relatively high levels, where the human ear is nearly equally effective at hearing from mid-low frequency (63Hz) to mid-high frequency (4kHz), but is less effective outside these frequencies.
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Impulsive noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Intermittent noise	The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.
L_{Max}	The maximum sound pressure level measured over a given period.

L_{Min}	The minimum sound pressure level measured over a given period.
L_1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L_{10}	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L_{90}	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
L_{eq}	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
Reflection	Sound wave changed in direction of propagation due to a solid object obscuring its path.
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain Leq sound levels over any period of time and can be used for predicting noise at various locations.
Sound	A fluctuation of air pressure which is propagated as a wave through air.
Sound absorption	The ability of a material to absorb sound energy through its conversion into thermal energy.
Sound level meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound pressure level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone.
Sound power level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.
Tonal noise	Containing a prominent frequency and characterised by a definite pitch.

APPENDIX B Sensitive receivers and noise management levels

B.1 NCAs and sensitive receiver identification

Land-Use file revision_date: rX_dd/mm/yy
Plot Date: 19/06/25 - 12:48 Layout: TM372 Land Use
GIS File: R:\AssocSydProjects\TM351-TM400\TM372 mt SMW - Eastern Tunnelling Page\5 Calcs\00 General\00 GIS\TM372-DA.qgz



LEGEND

Noise Sensitive Receivers
- Residential
- Mixed use
- Commercial
- Industrial
- Hotel/Motel/Hostel
- Medical facility
- Place of Worship
- Community centre
- Recording studio
- Library/Museum
- Childcare
- Educational
- Theatre/Auditorium
- Cinema
- Laboratory
- Flight simulator
- Horse Stable
- Recreational - Passive
- Recreational - Active
- Other
- Heritage

- Project NCAs
- Tunnel alignment
- Worksites

NCA	NML DS	NML DO	NML E	NML N
NCA06	71	66	61	57
NCA07	71	66	61	57

NCA: Noise Catchment Area
NML: Noise Management Level
D(S): Standard construction hours from 7 am to 6 pm Monday to Friday and from 8 am to 6 pm Saturday
D(O): Out-of-hours day period from 8 am to 6 pm Sunday and Public holidays - OOHW P1
E: Evening period from 7 pm to 10 pm Monday to Sundy - OOHW P1
N: Night-time period from 10 pm to 7am Monday to Friday, from 10 pm to 8 am Saturday, Sunday and Public holidays - OOHW P2

REV	BY	DATE	DESCRIPTION	APPROVED
r2	HB	19/06/25	Non-receiver update	TG
r1	DA	20/10/23	Heritage update	TG
r0	SS	03/04/23	Prepare figures	TG

FULL SIZE A3 REDUCED TO A4

A3 Original | Co-ordinate System: MGA Zone 56 | NOTE: Do not scale from this drawing.

0 30 60 90 120 150 m

1:3,000

CLIENT

EASTERN TUNNELLING PACKAGE
John Holland CPB Contractors Ghella JV

ACOUSTIC CONSULTANT
RENZO TONIN & ASSOCIATES
inspired to achieve
Ph (02) 8218 0500 Fax (02) 8218 0501

SYDNEY METRO WEST - EASTERN TUNNELLING PACKAGE
Hunter Street Station Site

Land Use, Worksites and NCAs

B.2 NCAs and noise management levels

Table B1: Noise Sensitive Receivers and Construction Noise Management Levels (airborne noise) **HUNTER STREET STATION**

NCA	Receiver Type	Reference RBL	Existing Noise Levels, dB(A)						Airborne NMLs based on ICNG (external)					Sleep Dist. L_{Amax}		Comments
			RBL Day	RBL Evening	RBL Night	LAeq_D	LAeq_E	LAeq_N	NMLD(S)	NMLD(O)	NMLE	NMLN	NMLMS	$L_{Aeq(15min)}$	L_{AFmax}	
Residential receivers																Nearest worksite
NCA06	Predominantly Residential	B.06	61	56	52	66	62	63	71	66	61	57	62	57	67	Hunter Street
NCA07	Predominantly Residential	B.06	61	56	52	66	62	63	71	66	61	57	62	57	67	Hunter Street
ICNG 'Other sensitive' receivers (NML applicable when in use)																
Classrooms at schools and other educational institutions									55	55	55	55	55	-	-	Source: ICNG Section 4.1.2 Table 3, assuming a conservative façade loss of 10 dB(A)
Hospital wards and operating theatres									65	65	65	65	65	-	-	Source: ICNG Section 4.1.2 Table 3, assuming a conservative façade loss of 20 dB(A)
Places of worship									55	55	55	55	55	-	-	Source: ICNG Section 4.1.2 Table 3, assuming a conservative façade loss of 10 dB(A)
Passive recreation areas (e.g. area used for reading, meditation)									60	60	60	60	60	-	-	Source: ICNG Section 4.1.2 Table 3
Active recreation areas (e.g. sports fields)									65	65	65	65	65	-	-	Source: ICNG Section 4.1.2 Table 3
Commercial premises (including offices and retail outlets)									70	70	70	70	70	-	-	Source: ICNG Section 4.1.3
Industrial premises									75	75	75	75	75	-	-	Source: ICNG Section 4.1.3
Non-ICNG 'Other sensitive' receivers (NML applicable when in use)																
Hotel - daytime and evening									70	70	70	-	-	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum', assuming atleast 20 dB(A) facade loss
Hotel - night-time									-	-	-	60	60	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum', assuming atleast 20 dB(A) facade loss
Café/ Bar/ Restaurant									60	60	60	60	60	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum', assuming 10 dB(A) facade loss
Childcare centre (indoor sleeping areas)									55	55	55	55	55	-	-	Source: CNVS Section 2.2.1, assuming a conservative façade loss of 10 dB(A)
Childcare centre (play areas)									65	65	65	65	65	-	-	Source: CNVS Section 2.2.1
Public Building									60	60	60	60	60	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum', assuming 10 dB(A) facade loss
Studio building (music recording studio)									45	45	45	45	45	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum', assuming 20 dB(A) facade loss
Studio building (film or television studio)									50	50	50	50	50	-	-	Source: AS2107 'maximum', assuming 20 dB(A) facade loss
Theatre/ Auditorium									50	50	50	50	50	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum', assuming 20 dB(A) facade loss

Notes: D(S): standard construction hours from 7 am to 6 pm Monday to Friday and from 8 am to 6 pm Saturday

D(O): out-of-hours day period from 8 am to 6 pm Sunday and Public holidays - OOHW P1

E: evening period from 6 pm to 10 pm Monday to Sunday - OOHW P1

N: night-time period from 10 pm to 7 am Monday to Friday, from 10 pm am to 8 am Saturday, Sunday and Public holidays - OOHW P2

MS: Morning shoulder from 05:00 to 07:00 Monday to Friday, and from 06:00 to 08:00 Saturday, Sunday and Public holidays - OOHW P2

APPENDIX C Construction timetable/ activities/ management

C.1 Construction timetable/activities/equipment

Table C1.1: Construction timetable/ activities/ equipment

Activity/ Work Area	Aspect	Plant/ Equipment (as provided by client)	Day	Evening	Night	Timing of Activity		Sound Power Level (Lw re: 1pW) in Noise			High noise plant	Vibration intensive plant	Notes
			7am - 6pm	6pm - 10pm	10pm - 7am	Start Date	Duration	L_{Aeq}	Penalty	L_{Amax}			
TBM RETRIEVAL													
Phase 1 - Tower crane footing	Excavation, pour, and ground anchors	**Shaft (bottom)**				Dec-25	20 days						
		Road saw	1	-	-			121	5	129	HN	-	Typical utilisation assumed to be 5 minutes during a 15 minute period
		Concrete vibrator	3	3	3			97	-	100	-	-	
		Tunnel agi	2	2	2			108	-	111	-	-	
		Drilling rig - Soilmex SM14 (or similar)	1	1	1			106	-	116	-	X	
		Compressor Kaeser M210 (or similar)	1	1	1			109	-	111	-	-	
		Grout mixer	1	1	1			105	-	108	-	-	
		Power hand tools	1	1	1			108	-	118	-	-	
		35ft EWP	2	2	2			95	-	98	-	-	
		7t telehandler	1	1	1			98	-	102	-	-	
		Surface											
		160t crane (Hunter's)	1	1	1			104	-	108	-	-	SWL came from site measurements
		Rigid trucks	1 per hr	1 per hr	1 per hr			106	-	111	-	-	
		Semi trucks	1 per shift	1 per shift	1 per shift			106	-	111	-	-	
		Float truck/ Low loader	1	1	1			106	-	111	-	-	
		Boom pump	1	1	1		3 days	103	-	107	-	-	Drop pipe or boom pump. Never both together
		Concrete Agi	3 per hr	3 per hr	3 per hr		3 days	108	-	111	-	-	
		Light vehicle	2	2	2			89	-	100	-	-	
		Power hand tools	1	1	1			108	-	118	-	-	Located in centre of Stage 1 platform area
Phase 2 - Tower crane establishment		**Shaft (bottom)**				Jan-26	5 days						
		Compressor Kaeser M210 (or similar)	1	1	1			109	-	111	-	-	
		34ft EWP	2	2	2			94	-	98	-	-	
		Power hand tools	1	1	1			108	-	118	-	-	
		7t telehandler	1	1	1			94	-	98	-	-	
		Surface											
		400t crane	1	1	1			106	-	110	-	-	
		7t telehandler	1	1	1			94	-	98	-	-	
		Rigid trucks	1 per hr	1 per hr	1 per hr			106	-	111	-	-	
		OSOM semi trucks	2 per shift	2 per shift	2 per shift			106	-	111	-	-	
		Light vehicle	2	2	2			89	-	100	-	-	
		Traffic control: Light vehicles + radios	6	6	6			89	-	100	-	-	
		Power hand tools	1	1	1			108	-	118	-	-	
Phase 3 - Demobilisation of TBM		**Shaft (bottom)**				Jan-26	60 days						
		SPMT	1	1	1			106	-	111	-	-	
		34ft EWP	2	2	2			94	-	98	-	-	
		Hand tools	1	1	1			116	-	118	-	-	
		7t telehandler	1	1	1			98	-	102	-	-	
		Power hand tools	1	1	1			108	-	118	-	-	Rattle gun at the bottom of shaft. No tools expected on the surface
		Surface											
		Tower crane M1280D	1	1	1			114	5	119	HN	-	Unattenuated SWL. Attenuation in line with AFJV DNVIS Marr Tower Crane applied in model when specified. Estimated noise reduction of 10dB(A).
		7t telehandler	1	1	1			98	-	102	-	-	
		Semi trucks	12 per shift	12 per shift	12 per shift			106	-	111	-	-	
		160t crawler crane (same as Hunter St currently)	1	1	1			104	-	108	-	-	
		OSOM trucks (drop deck trailer)	5 per shift	5 per shift	5 per shift			106	-	111	-	-	Peak frequency once dismantling start
		Traffic control: Light vehicles + radios	6	6	6			89	-	100	-	-	
		Lighting tower	4	4	4			90	-	93	-	-	
Phase 4 - Tower crane demobilisation		**Shaft (bottom)**				Mar-26	5 days						
		Compressor Kaeser M210 (or similar)	1	1	1			109	-	111	-	-	
		34ft EWP	2	2	2			94	-	98	-	-	
		Power hand tools	1	1	1			108	-	118	-	-	Rattle guns to undo bolts on tower crane
		7t telehandler	1	1	1			94	-	98	-	-	
		Surface											
		400t crane	1	1	1			106	-	110	-	-	No more than two cranes assumed to be active concurently
		160t crane (Hunter's)	1	1	1			104	-	108	-	-	
		7t telehandler	1	1	1			98	-	102	-	-	
		Rigid trucks	1 per hr	1 per hr	1 per hr			106	-	111	-	-	
		Semi trucks	1 per hr	1 per hr	1 per hr			106	-	111	-	-	
		Float truck/ Low loader	2 per shift	2 per shift	2 per shift			106	-	111	-	-	
		OSOM trucks	5 per shift	5 per shift	5 per shift			106	-	111	-	-	OSOM trucks will be loaded on day shift but leave site on night shift
		Light vehicle	2	2	2			89	-	100	-	-	
		Tower crane M1280D	1	1	1		1 day	114	5	119	HN	-	Diesel. Electric not possible due to lifting requirements
		Traffic control: Light vehicles + radios	6	6	6			89	-	100	-	-	
		Lighting tower	4	4	4			90	-	93	-	-	
		Power hand tools	1	1	1			108	-	118	-	-	Rattle guns to undo bolts on tower crane

Table C1.2: Construction timetable (indicative)

Location	Activity	2025								2026											
		November				December				January				February				March			
Hunter St East Platform and Shaft	Phase 1 - Tower Crane Footings																				
Hunter St East Platform and Shaft	Phase 2 - Tower Crane Establishment																				
Hunter St East Platform and Shaft	Phase 3 - TBM Retrieval																				
Hunter St East Platform and Shaft	Phase 4 - Tower Crane Demobilisation																				

APPENDIX D Construction airborne noise impacts

D.1 Predicted noise levels

The detailed predicted levels have been provided to JCG in a spreadsheet table to more adequately mitigate and manage potential noise impacts.

D.2 Number of receivers above NMLs

The number of exceedances has been provided to JCG in a spreadsheet table.

D.3 Additional management measures

The additional management measures have been provided to JCG in a spreadsheet table to more adequately mitigate and manage potential noise impacts.

ACOUSTICS ADVISOR ENDORSEMENT

SYDNEY METRO WEST (SSI 19238057)

Review of	**Eastern Tunnelling Package:** Detailed Noise and Vibration Impact Statement (DNVIS) – Hunter Street Station – Tower Crane Assembly, Disassembly and TBM Retrieval.	**Reviewed document reference:**	TM372-02-1-03F11 SMW-ETP_ADD_DNVIS-HUN-TBM Retrieval OOHW (r3) Rev 5 dated 5 November 2025
Prepared by:	[redacted]		
Date of issue:	14 November 2025		

As approved Alternate Acoustics Advisor for the Sydney Metro West project, I reviewed and commented on previous revisions of this DNVIS addendum.

The Addendum has been prepared to assess potential noise and vibration impacts from the retrieval of Tunnel Boring Machines (TBMs) at Hunter Street Station East. TBM retrieval will take place during standard and Out of Hours (OOHs).

John Holland CPB Contractors Ghella Joint Venture (JCG) advises that:

- TBM retrieval includes:
    - Preparing Tower Crane footings
    - Tower Crane establishment
    - Breakthrough and demobilisation of TBMs
    - Tower Crane demobilisation and handover.
- TBM retrieval was identified as a 24/7 activity in the Project's Environmental Impact Statement (EIS)
- Crane mobilisation and demobilisation and transport off-site of some TBM components will be via over-size and over-mass (OSOM) delivery trucks, requiring OOH road lane closures

I'm satisfied that Revision 5 has adequately addressed my comments, and those of the Environmental Representative (ER) and Sydney Metro, and I endorse this addendum for implementation, subject of course to the Environment Protection Licence (EPL) being varied to permit the works between 10pm and 7am.

[redacted]

[redacted]Metro West Alternate Acoustics Advisor