12 June 2025
TM372-02-1-03F09 SMW-ETP_ADD_DNVIS-HUN-HE2-TL (r3)

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Sydney Metro West Eastern Tunnelling Package - Addendum Detailed Noise and Vibration Impact Statement - Hunter Street East Mined Tunnelling and Associated Activities

1 Introduction

A Detailed Noise and Vibration Impact Statement (DNVIS) has been prepared for the **ETP Hunter Street Station surface worksites** [1]. 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 has been prepared consistent with the Hunter Street Station DNVIS to assess potential noise and vibration impacts from the changes to Stage 2 mined tunnelling and associated activities without an acoustic shed, specifically changes to Stage 2 – Tunnel Lining.

2 Construction works, hours and objectives

2.1 Construction works addressed in this Addendum DNVIS

The works to be addressed in this Addendum DNVIS are summarised in Table 2-1, being changes to works related to Stage 2 – Tunnel Lining at Hunter Street East (activity reference: HE2-TL).

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					
Stage 2 – Tunnel Lining (HE2-TL)	Plant located at entrance to decline	Standard hours + OOHW (D/E/N)	CoA D23(d)(ii)	May 25	7 months

The changes to Stage 2 – Tunnel Lining assessed in this Addendum DNIVS include:

- Relocation of plant and equipment from the surface platform to the decline area.
- Exclusion of the crawler crane from the works.
- Exclusion of on-site delivery truck movements
- Introduction of a concrete pump.
- Increase in concrete agitator truck movements from 5 to 8 per hour
- Inclusion of three concrete agitator trucks idling on O'Connell Street.

These changes are illustrated in Figure 2-1.

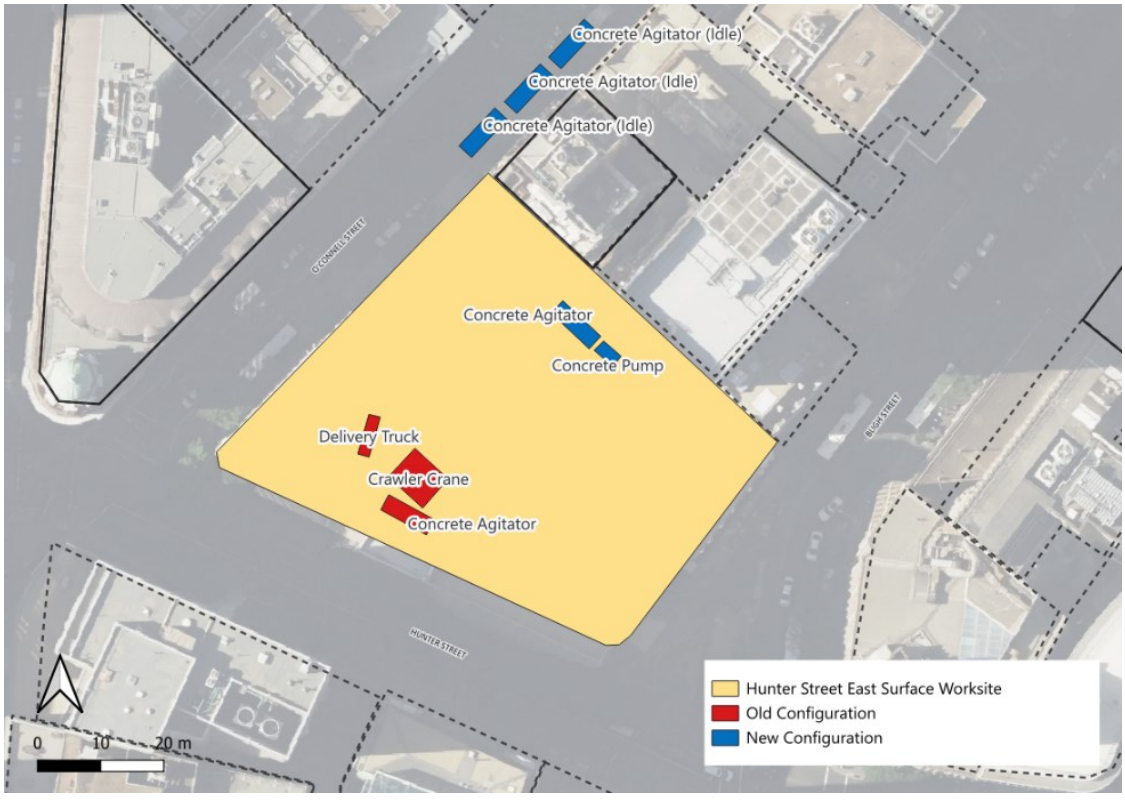

Figure 2-1 Relocation of plant and equipment for Hunter East Stage 2 - Tunnel Lining

Table 2-2 lists the original plant items and their respective sound power levels (SWLs) and Table 2-3 the revised plant items and their respective SWLs. The SWL for the concrete pump in Table 2-3 was calculated from onsite measurements taken 12 May 2025. A summary of the measurements and the calculated SWL is included as C.1 of this report.

Table 2-2 Sound power levels for plant involved in DNVIS assessment

Plant	Lw (dB(A))	
	L_{Aeq}	L_{Amax}
Concrete Agitator Movement (5 per hour)	108	111
Crawler Crane	104	108
Delivery Truck (4 per hour)	106	111

Table 2-3 Sound power levels for plant involved in Addendum configuration

Plant	L_w (dB(A))	
	L_{Aeq}	L_{Amax}
Concrete Agitator Movement (8 per hour)	108	111
Concrete Agitator Idling	96	-[2]
Concrete Pump	103[1]	107

Note: 1. Sound power level measurement of concrete pump undertaken on site to verify noise level is consistent with assumptions (see APPENDIX D)

2. No L_{Amax} is given for the idling concrete trucks as idling produces steady noise levels

2.1.1 Construction traffic

The concrete agitator trucks idling on O'Connell Street have been assessed as part of the concrete lining for the cavern. Thus, based on the proposed activities presented in Table 2-1 assessed in this issue of the Addendum DNVIS, the construction traffic is consistent with what was assessed in the DNVIS. No further assessment is required.

2.2 Construction Hours

Construction hours are as reported in the DNVIS Section 2.2.

2.3 Justification for OOHW

Tunnel lining and delivery of concrete to site are considered as prescribed activities under Condition of Approval 23(d)(ii). As such, these works are permitted to occur at all hours provided that all reasonable and feasible mitigation measures are employed.

In addition to the above, extended hours of concrete deliveries are required at the Hunter Street cavern due to formwork design limitations with respect to the rate of rise. The rate of rise, the speed in which you can place concrete into a formwork system, is governed by the Australian Standards (AS3610 Section 4.4) and is calculated using several variables including vertical height of formwork, concrete

temperature, density of concrete etc. Due to the height of some tunnel profiles at Hunter Street, JCG will require extended hours to be able to comply with this Australian Standard and maintain a continuous concrete pour to ensure the structure performs as required by the permanent lining design, limiting construction joints within the arched profiles. The invert pours will be ongoing for upwards of 24 hours due to the volume of concrete that must be poured. As is the case with all tunnel lining pours, once started, the pour must be continuous until finished.

Site specific mitigation measures for tunnel lining at Hunter Street East are provided in Section 4.

2.4 Construction noise and vibration objectives

The 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 DNVIS. Construction noise objectives specific to these works are presented in Table B1 in APPENDIX B of this report.

3 Construction noise and vibration assessment

3.1 Airborne noise assessment

The airborne noise prediction methodology is consistent with the DNVIS (Section 5.1).

3.1.1 Most affected receivers

In this section of the Addendum DNVIS, specific airborne noise impacts have been considered at the most affected receivers near the Hunter Street East worksite. These include the residential receiver at 16 O'Connell Street, along with the Tank Stream Hotel, the Radisson Hotel and the Sofitel Sydney Wentworth. A comprehensive list of predicted levels at all receivers is given in APPENDIX C.

Predicted airborne noise levels for the nearby most affected receivers, as presented in the initial DNVIS assessment, are summarised in Table 3-1 (HE2-TL). Predicted noise levels for the updated Stage 2 – Tunnel Lining configuration (HE2-TL-A) are also presented. The predictions reflect the change in plant and equipment layout, including the relocation of works to the decline area, the inclusion of a concrete pump, the inclusion of concrete agitator trucks idling on O'Connell Street, the increase in concrete agitator truck movements and the exclusion of the crawler crane and delivery truck movements.

Table 3-1 Predicted external noise levels at nearby sensitive receivers

NCA	Address	Estimated facade loss, dB(A)	Evening $L_{Aeq(15min)}$			Night $L_{Aeq(15min)}$			Sleep L_{Amax}		
			NML *	HE2-TL	HE2-TL-A	NML *	HE2-TL	HE2-TL-A	NML	HE2-TL	HE2-TL-A
NCA 07	16 O'Connell Street Sydney	20	81	63	64	77	63	64	67^	70	65
OSR _HTL	The Tank Stream Hotel, 97-99 Pitt Street	30	80	63	54	70	63	54	80*	68	55
OSR _HTL	Radisson Hotel, Level G-8, 27 O'Connell Street	35	85	74	73	75	74	73	85*	81	74
OSR _HTL	Radisson Hotel, Level 9-12 27 O'Connell Street	25	75	74	75	65	74	**75**	75*	77	**76**
OSR _HTL	Sofitel Sydney Wentworth, 101 Phillip Street	25	75	69	59	65	69	59	75*	71	60

NOTE: * External NML, adjusted to include estimated façade loss

^ Residential sleep disturbance assessed externally at 1 m from open window. Not adjusted for façade loss.

The updated Stage 2 – Tunnel Lining scenario (HE2-TL-A) results in predicted noise levels at the nearby most affected receivers similar to or less than those reported for HE2-TL in the DNVIS. Predicted levels during the evening and night periods at the Tank Stream Hotel and the Sofitel Sydney Wentworth have decreased significantly. Maximum instantaneous noise level events have also decreased. This reduction in predicted noise levels is due to the relocation of plant and equipment to the decline resulting in greater barrier effects from intervening structures between the plant and equipment and the receivers.

Predicted noise levels at the Radisson Hotel (Levels 9 – 12) and 16 O'Connell Street have increased by 1 dB(A) during the evening and night periods. Whilst predicted noise levels have increased slightly at these receivers, there are no new exceedances of established NMLs.

3.1.2 Summary of all receivers

To understand how the noise impacts of the updated configuration for Stage 2 – Tunnel Lining differs from the initial configuration, a comparison of the number of receivers above NMLs is given in Table 3-2. Whilst commercial receivers are reported in Table 3-2, they are unlikely to be operational during the OOH period. Residential and other sensitive receivers likely to be in use during the OOH periods (i.e. hotels) are detailed in Table 3-1. The explanation of change to noise environment for the most affected receivers given in Section 3.1.1 holds for all receivers.

Table 3-2 Comparison of receivers above NMLs when in use

Receiver Type	Number of receivers above NML		
	HE2-TL	HE2-TL-A	Difference
Residential	0	0	0
Hotel	5	1	- 4
Commercial	3	6	+ 3

3.2 Ground-borne noise assessment

There have been no changes to the ground borne noise assessment for this scope of work.

3.3 Vibration assessment

There have been no changes to the ground borne vibration assessment for this scope of work.

4 Mitigation measures

In addition to the mitigation and management measures outlined in Section 9 of the DNVIS, the following specific mitigation measures, given in Table 4-1, will be implemented as applicable during the proposed works where feasible and reasonable. Consideration of industry best practice methods will be taken in accordance with Condition D28 of the Planning Approval.

Table 4-1: Specific mitigation measures

Control measure	Description of the control measure	Feasible/ reasonable test	Adopted?
Orient concrete pump to minimise noise emission	Pump oriented on site to ensure noisier sides are oriented away from sensitive receivers, where practicable.	This measure could be feasibly and reasonably implemented.	Yes
Noise blankets	Install noise blankets around hopper and along open side of pump to reduce impact (in particular on the Radisson Hotel).	This measure could be feasibly and reasonably implemented.	Yes
Cover over concrete pump	Mezzanine B-class will still be in place over the top of the concrete pump.	This measure could be feasibly and reasonably implemented.	Yes
Keep entrance gates closed	Keep entrance gates on O'Connell Street closed when practicable.	This measure could be feasibly and reasonably implemented.	Yes
Caution when moving concrete agitators on O'Connell Street	Ensure that compression breaking and reverse beeping does not occur when concrete agitators are idling on O'Connell Street.	This measure could be feasibly and reasonably implemented.	Yes
Ensure concrete agitators only idle in specified location	Concrete agitators are to idle in the location on O'Connell Street that has been designated, not elsewhere.	This measure could be feasibly and reasonably implemented.	Yes
Monitoring to confirm predicted noise levels	Attended monitoring should be conducted to validate the predicted noise levels.	This measure could be feasibly and reasonably implemented.	Yes

5 Impact classification

The impact classification from Section 10 of the 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 predicted noise levels marginally exceed the night and sleep disturbance NMLs for the Radison Hotel. 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 DNVIS.

6 Conclusion

Construction noise and vibration impacts due to changes to the Stage 2 – Tunnel Lining works method have been described in this Addendum DNVIS, to identify potential environmental risks associated with construction noise and vibration. The specific changes to the works assessed include the relocation of works to the decline area, the inclusion of a concrete pump, the inclusion of concrete agitator trucks idling on O'Connell Street, the increase in concrete agitator truck movements and the exclusion of the crawler crane and delivery truck movements. Construction noise and vibration objectives have been established in the DNVIS, consistent with the conditions of approval for the Project and the EIS.

The predicted airborne noise levels indicate there are no construction noise affected residential receivers from the construction works assessed in this Addendum DNVIS. One hotel receiver and six commercial receivers are predicted to exceed their respective NMLs.

All practicable mitigation measures identified in the Section 9 of the DNVIS and Section 4 of this memorandum will be implemented, such that the noise levels experienced by the receivers will be reduced with the aim of achieving the NMLs.

Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Reviewed / Authorised
23.05.2025	Initial issue	0	1	H. BAKER	T. GOWEN	T. GOWEN
27.05.2025	Minor edits	-	2	H. BAKER	T. GOWEN	T. GOWEN
12.06.2025	Respond to AA/ ER comments	-	3	H. BAKER	T. GOWEN	T. GOWEN

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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: 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 and Associates, Sydney Metro West Eastern Tunnelling Package - Detailed Noise and Vibration Impact Statement – Tunnelling, Sydney, 19 October 2023.

[2] Sydney Metro Construction Noise and Vibration Standard Version 4.3 (SM-20-00098866), Sydney, 2020.

[3] Standards Australia, AS 3600-2018 Concrete Structures, Sydney, 2018;

[4] Transport for NSW Construction Noise and Vibration Strategy (ref: ST-157/4.1) April 2019

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

[6] 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

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

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

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

[10] Department of Environment, Climate Change and Water 2011 NSW Road Noise Policy (RNP)

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

[12] Environment Protection Authority 2000 NSW Industrial Noise Policy (INP)

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

[14] Australian Standard AS 2187.2-2006 Explosives - Storage and Use - Use of Explosives

[15] British Standard BS 7385 Part2-1993, Evaluation and measurements for vibration in buildings Part 2

[16] German Standard DIN 4150-3: 2016-12, Structural vibration - Effects of vibration on structures, December 2016

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

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

[19] 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 100dBThe sound of a rock band 120dBDeafening
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 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, assuming a conservative façade loss of 10 dB(A)
Hospital wards and operating theatres									65	65	65	65	65	-	-	Source: ICNG, assuming a conservative façade loss of 20 dB(A)
Places of worship									55	55	55	55	55	-	-	Source: ICNG, 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
Active recreation areas (e.g. sports fields)									65	65	65	65	65	-	-	Source: ICNG
Commercial premises (including offices and retail outlets)									70	70	70	70	70	-	-	Source: ICNG
Industrial premises									75	75	75	75	75	-	-	Source: ICNG
Non-ICNG 'Other sensitive' receivers (GBNML applicable when in use)																
Hotel - daytime and evening									70	70	70	70	70	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum', assuming 20 dB(A) facade loss
Hotel - night-time									60	60	60	60	60	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum', assuming 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 Predicted noise levels

C.1 Detailed predicted airborne noise levels

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

APPENDIX D Concrete pump sound power level check

Plant Sound Power Level Check

Project:	ETP - Hunter Street East
Project number:	TM372
Plant Item:	Concrete Pump
Date of test:	12/05/2025
Operating Condition:	Pumping
Directivity factor:	2 On a flat plant
Sound Level Meter (SLM):	XL2 NTi SN: A2A-12853-E0
SLM Last calibration date:	30/04/2024

Measurement data	Measurement Location									
	1	2	3	4	5	6	7	8	9	10
Measured L_{Aeq}	79	81	87	79						
Distance from source (m)	3	2	2	2						
Calculated L_{Aeq} Lw	96	96	103	94						

Calculated Sound Power Level

	LZeq - Frequency, HZ									L_{Aeq}
	31	63	125	250	500	1000	2000	4000	8000	
Average (log)	97	101	100	97	96	94	92	87	79	99
90 percentile	99	103	102	99	98	96	94	89	81	101
Worst case	100	104	104	101	100	98	96	91	83	103

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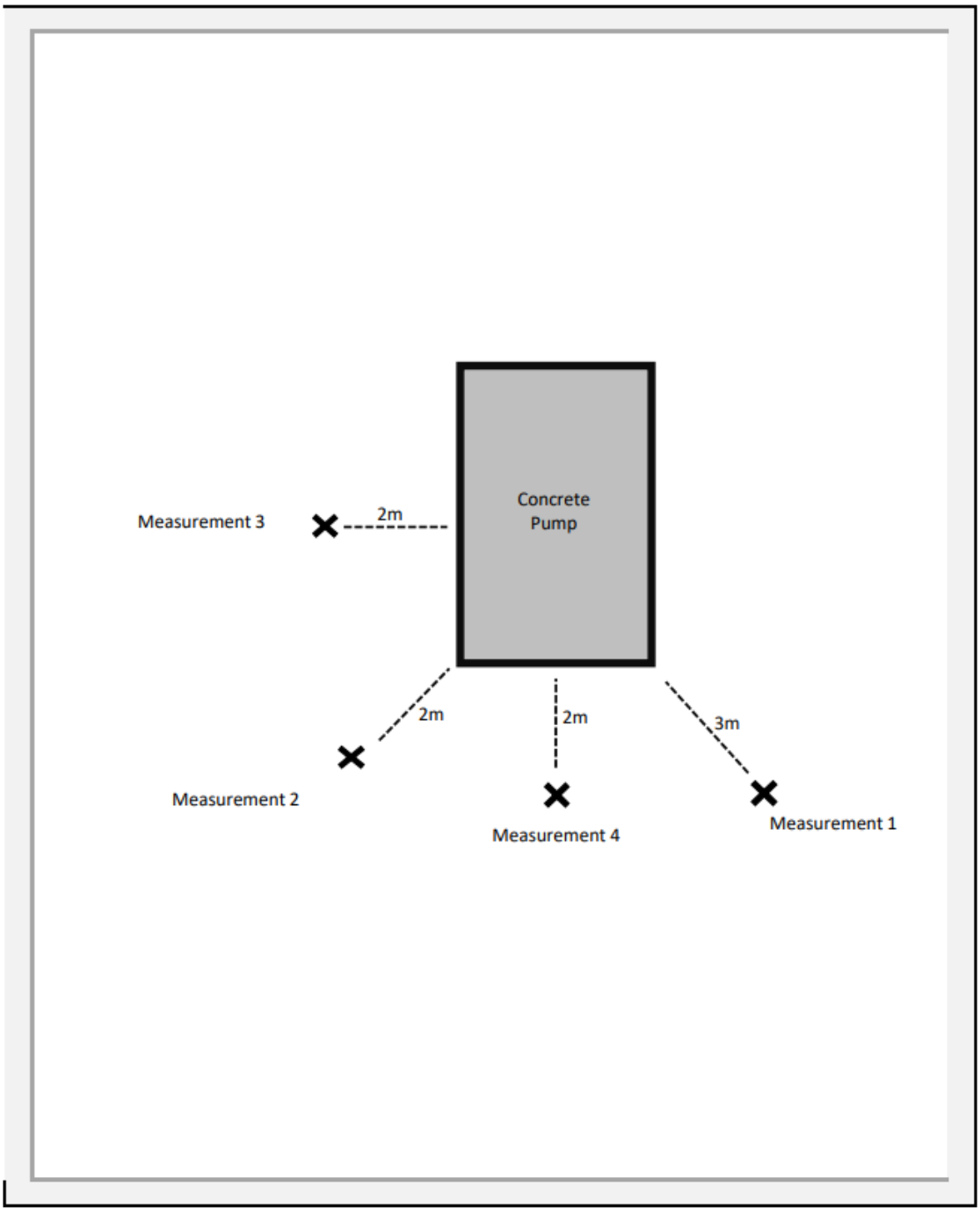
Measurement Location Diagram



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ACOUSTICS ADVISOR ENDORSEMENT

SYDNEY METRO WEST (SSI 19238057)

Review of	**Eastern Tunnelling Package:** Detailed Noise and Vibration Impact Statement (DNVIS) – Hunter Street Station East – addendum for Mined Tunnelling and Associated Activities	**Reviewed document reference:**	TM372-02-1-03F09 SMW-ETP_ADD_DNVIS-HUN-HE2-TL (R3) Rev 3 dated 12 June 2025
Prepared by:	Larry Clark, Alternate Acoustics Advisor		
Date of issue:	25 June 2025		

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

The Addendum has been prepared to assess potential noise and vibration impacts from the changes to Stage 2 mined tunnelling and associated activities without an acoustic shed, specifically changes to Stage 2 – Tunnel Lining.

I'm satisfied that Revision 3 has adequately addressed my comments, and those of the Environmental Representative (ER), and I endorse this addendum for implementation.

Larry Clark

Larry Clark, Metro West Alternate Acoustics Advisor