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Sydney Metro Eastern Tunnelling Project - DNVIS Addendum - Hunter Street Station - Skinners Hotel Strengthening

1 Introduction

A Detailed Noise and Vibration Impact Statement (DNVIS) has been prepared for the Sydney Metro West – Eastern Tunnelling Package (ETP) **Hunter Street Station** surface worksites (Hunter Street DNVIS) [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 ETP Works.

This Addendum has been prepared consistent with the Hunter Street Station DNVIS to assess potential noise and vibration impacts from the Skinners Hotel Strengthening. Table 1-1 summarises the proposed changes to the activities described in the Hunter Street DNVIS.

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

Site	Change to construction works	Change to DNVIS?	Comment
Hunter Street West	Skinners Hotel Strengthening OOHW.	Yes	Hunter Street DNVIS Table C1-1 updated. Additional activities outlined in Section 2.1 and Table C1 in APPENDIX C.
Hunter Street East	Skinners Hotel Strengthening activities only occur at Hunter West. No change to activities at Hunter Street East.	No	Hunter Street DNVIS Table C1-2 assumptions remain unchanged.

It has been identified that additional strengthening of the Skinners Hotel building is required prior to the commencement of Stage 1 excavation on site. The works are adjacent to the footpath and require closing of the footpath to allow completion, which will need to be completed outside standard hours over 8 nights under a Road Occupancy Licence, as discussed in Section 2.2.1.

2 Construction works and hours

2.1 Construction works addressed in this Addendum DNVIS

The additional works assessed in this addendum to the Pyrmont DNVIS will be undertaken during and outside standard the construction hours defined in Section 2.2 of the DNVIS. 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
Hunter Street West Stage 1 Excavation	Skinner Hotel Strengthening (Northern Façade)	Standard hours + OOHW (E/N)*	CoA D23(a) EPL L5.8	Jul-25	8 nights

Notes: 'OOHW' means Out of Hours works, or work outside the standard construction hours (see Section 2.2 of the DNVIS)

'OOHW(E)' is the 'Evening' period, 6pm to 10pm Monday to Sunday

'OOHW(N) is the 'Night' period, 10pm to 7am Sunday/Monday to Thursday/ Friday; 10pm to 8am Friday/Saturday and Saturday/ Sunday

*Justification of OOHW presented in Section 2.2.1 of this report

Table C.1 in APPENDIX C presents the list of plant proposed to be used for these works and their assumed sound power levels. There are no vibration intensive plant identified in Table C.1. The proposed site layout for each set of works is presented in Figure C-1 and Figure C-2 in APPENDIX C.

2.1.1 Construction traffic noise

Based on the proposed activities presented in Table C1 in APPENDIX C, the construction traffic is consistent with what was assessed in the DNVIS. No further assessment is required.

2.1.2 Ground-borne noise and vibration

There are no vibration intensive activities required for these works. No further assessment is required.

2.2 Construction Hours

Construction hours are as reported in the DNVIS Section 2.2.

2.2.1 Justification for OOHW

The Skinners Hotel Strengthening works will involve operating mobile plant and lifting over public areas, including pedestrian footpaths creating a safety risk to the general public. JCG have been unable to obtain Road Occupancy License (ROL) for the footpath to be closed during the daytime (standard hours). The ROL has been obtained outside standard hours to minimise the risk during periods with high pedestrian volumes. This is in accordance with Condition D23(a) and EPL Condition L5.8.

3 Construction noise 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 airborne noise objectives are detailed in the CNVS Section 2. A summary of the objectives as applicable to the Pyrmont Station works is provided in Table 4.1 of the DNVIS. Construction noise objectives specific to these works and sensitive receivers and noise management levels (NMLs) are presented in Table B1. All reasonable and feasible mitigation measures will be implemented to reduce noise impacts from the TBM support works towards (or below) the NMLs.

4 Construction airborne noise impacts

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

Table 4-1: Assessed construction scenarios

Construction activity	Scenario ID	High impact item	Vibration significant item
Western worksite			
Stage 1 Excavation: Skinner Hotel Strengthening (Northern Façade)	HW-SHS	-	-
Eastern worksite			
Stage 2 Mined tunnelling and associated activities (without shed, prior to platform completion)*	HE2-TL2	-	-

NOTE: * Mined tunnelling and associated activities at Hunter Street East consistent with DNVIS with occur concurrently with HW-SHS works.

4.1 Predicted noise levels

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

Assessment	Time of day	Key			
$L_{Aeq(15min)}$	Standard hours[1] or Outside standard hours	0-10 dB(A) above NML (green)	11-20 dB(A) above NML (yellow)	21-30 dB(A) above NML (orange)	>30 dB(A) above NML (purple)
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.

Table 4-3 and Table 4-4 presents a summary of the number of residential receivers and 'other sensitive receivers' (in use) likely to be noise affected by the additional activity associated with the revised 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. Predicted noise levels are presented in APPENDIX D.

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

Construction activity	Scenario ID	Evening				Night				Sleep disturbance	
		L_{Aeq}				L_{Aeq}				L_{Aeq}	L_{Amax}
		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)
Stage 1 Excavation: Skinner Hotel Strengthening (Northern Façade)	HW-SHS	0	0	0	0	0	0	0	0	0	0
Stage 1 Excavation: Skinner Hotel Strengthening (Northern Façade) (with HE2-TL2)*`	HW-SHS*	0	0	0	0	0	0	0	0	0	0

NOTE: Construction noise level cells are shaded based upon the predicted worst case NML exceedance in accordance with the key presented in Table 4-2

* Predicted noise levels with mined tunnelling and associated activities at Hunter Street East concurrent with HW-SHS works

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

Construction activity	Scenario ID	Commercial[1, 2]				Hotel/Motel/ Hostel[1,2, 4]				Other[1, 2]			
		L_{Aeq}				L_{Aeq}				L_{Aeq}			
		1 – 2 dB(A)	2 – 5 dB(A)	5-10 dB(A)	10-20 dB(A)	1 – 2 dB(A)	2 – 5 dB(A)	5-10 dB(A)	10-20 dB(A)	1 – 2 dB(A)	2 – 5 dB(A)	5-10 dB(A)	10-20 dB(A)
Stage 1 Excavation: Skinner Hotel Strengthening (Northern Façade)	HW-SHS	0	4	1	0	0	1	0	1	0	0	0	0
Stage 1 Excavation: Skinner Hotel Strengthening (Northern Façade) (with HE2-TL2)*	HW-SHS*	5	4	1	2	0	1	1	1	0	0	0	0

NOTE: Construction noise level cells are shaded based upon the predicted worst case NML exceedance in accordance with the key presented in Table 4-2

1. Commercial 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 DNVIS

2. Impacts only applicable when facility is in use. Commercial receivers are unlike to be in use at the time of the OOHW.

3. Other sensitive receivers are land uses detailed and assessed as per the ICNG Table 3.

4. Hotels are assessed against the more sensitive night NML (interior noise level of 40 dB(A)).

* Predicted noise levels with mined tunnelling and associated activities at Hunter Street East concurrent with HW-SHS works

4.1.1 Out of hours work

The results summarised in Table 4-3 and Table 4-4 show that there are no construction noise affected residential receivers during the works associated with the completion and use of the platform outside standard construction hours. In addition, no (in use) other sensitive receivers are predicted to be construction noise affected, except for hotels during the completion of the platform.

During the evening and night periods there are two hotels where predicted noise levels are marginally above the NML due to Skinners Hotel Strengthening works. High instantaneous noise generating activities, such as metal on metal hammering, have been limited or removed to manage impacts during the night period. The following hotels will be impacted by the Skinners Hotel Strengthening works:

- **A by Adina (Levels 2-15)** – exceeding by 1 dB(A) during the evening and 11 dB(A) during the night from the Skinners Hotel Strengthening works.
- **The Grand Hotel** – exceeding by 5 dB(A) during the night from the Skinners Hotel Strengthening works.

When the impacts from Skinners Hotel Strengthening works are assessed concurrently with Stage 2 Tunnel Lining activities at Hunter Street East, there are no significant cumulative impacts on any individual receiver. There is no receiver predicted to be impacted by either activity which will experience a greater impact when the activities are concurrent.

Monitoring should be conducted on site to verify the actual noise emissions from the Skinners Hotel Strengthening works associated with the platform construction, and whether mitigation measures can be implemented to reduce construction noise for the duration of the works.

Mitigation and management measures summarised in Section 9 of the 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 4.2.

4.1.2 Sleep disturbance

The results summarised in Table 4-3 show that there no residential receivers that may experience construction noise levels above the L_{Amax} sleep disturbance criteria from Skinners Hotel Strengthening works. There are two hotel receivers that are predicted to experience L_{Amax} events in exceedance of the sleep disturbance criteria, being:

- **A by Adina (Levels 2-15)** – exceeding by 8 dB(A)
- **The Grand Hotel** – exceeding by 4 dB(A)

Recommendations to limit the risk of sleep disturbance events occurring are provided in Section 4.2.

4.2 Mitigation and management measures

4.2.1 Specific mitigation measures

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

Table 4-5: Specific mitigation measures

Control measure	Description of the control measure	Feasible/ reasonable test	Adopted?
Temporary acoustic enclosures	Drills, grinders and rattle guns will be used inside an acoustic enclosure made with noise blankets over a scaffold structure, including a roof. This would reduce noise from cutting/ grinding by approx. 10 dB(A).	This would not be practicable within the work space available.	No
Prefabrication of steel members	Where possible, cut and drill fixing holes in the steel members during the before 10pm.	This measure could be feasibly and reasonably be implemented.	Yes
Non-tonal reversing alarms	Fit all mobile plant with broadband alarms and ensure that tonal alarms are not used.	This measure could be feasibly and reasonably be implemented.	Yes
Reduce concurrent operation of hand tools	Where possible, the magnetic drill, grinder and rattle gun are not to be operated concurrently.	This measure could be feasibly and reasonably be implemented.	Yes
Positioning of crane	Position the crane with the exhaust facing away from the Adina and other receivers to the North.	This measure could be 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 during platform construction and FRP works by approx. 8-10 dB during the night period.	This measure could be feasibly and reasonably be implemented.	Yes
Activity specific work practices to minimise impacts	The following management measures will be incorporated into the work practices for OOHW assessed in this report Each measure will be reiterated at the prestart toolbox talk: - Use of soft slings or covered chains for all lifting at night. - No dropping of items, controlled placement of items into the laydown area, throwing of metal items - No excessive revving of plant and vehicle engines or slamming of doors. - Manage behaviour on site (no shouting etc)	This measure could be feasibly and reasonably be implemented.	Yes
Managed OOHW (EPL Condition L5.9)	The OOHW assessed in this addendum will meet the requirements of EPL Condition L5.9.	This measure could be feasibly and reasonably be implemented.	Yes

4.2.2 Additional noise mitigation measures

The steps to be carried out to determine the additional airborne noise management measures to be implemented are identified in Section 9.4.1 of the DNVIS. Prior to the commencement of works, receivers identified in APPENDIX D will be notified to advise that noise from the works may at times be audible. Additional airborne noise management measures will be implemented as per Table D.3.

4.2.3 Consultation with noise affected receivers

The following proposed actions will be completed by the Communications Team prior to the Skinners Hotel Strengthening works at Hunter Street West. JCG JV will start proactively engaging with stakeholders prior to the activities occurring and in accordance with the CNVS. Further details regarding consultation are provided in **Error! Reference source not found.**.

Table 4-6: Proposed consultation plan prior to commencement of and during OOHW

Date	Item	Status
July 25	Monthly update	In progress
July 25	Install flyers in building foyers	In progress
One week prior	Work notification	Ongoing
One week prior	Weekly email update	Ongoing
One week prior	Direct email to residents and businesses	Ongoing
One day prior (and as required)	Text message	Ongoing
Ongoing	Weekly email updates – work updates	Commenced, ongoing

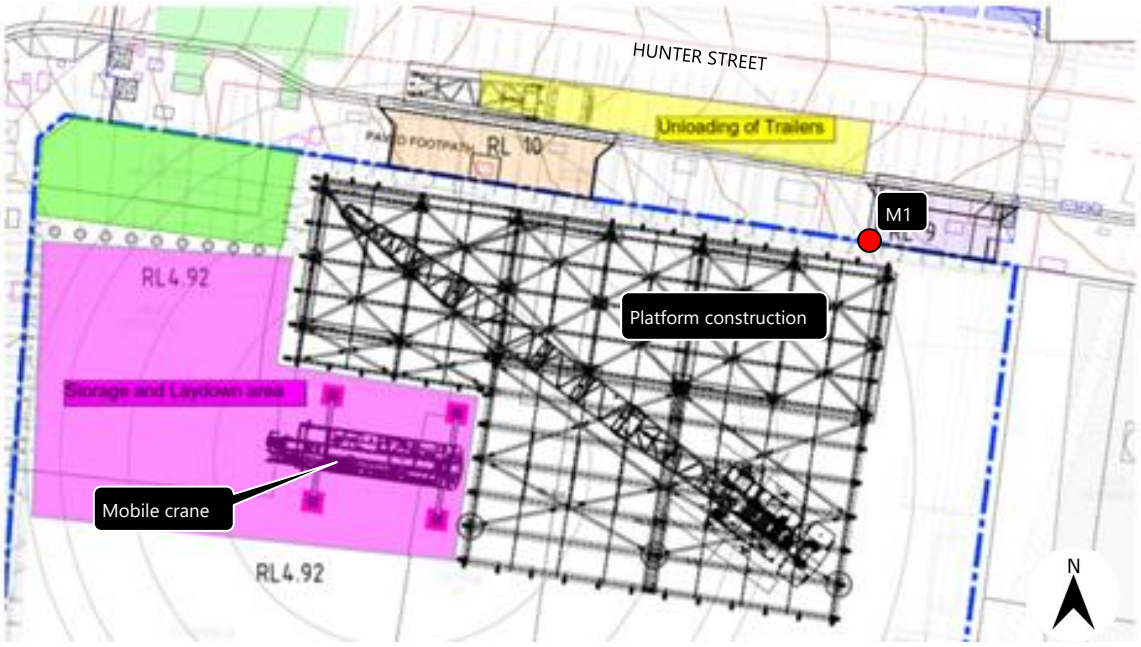
4.2.4 Attended airborne noise monitoring

As noted in Section 9.6.1 of the DNVIS, attended noise monitoring is to be undertaken to verify that noise levels resulting from the Skinners Hotel Strengthening 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 4-7: Nominated verification monitoring locations

Type of monitoring	NCA/ Receiver type	Nominated receiver address
Attended	N/A	Location M2 (see Figure 4-1)
Attended	OSR (HOTEL)	2 HUNTER STREET SYDNEY (A BY ADINA)
Attended	OSR (HOTEL)	30 HUNTER STREET SYDNEY (THE GRAND HOTEL)
Attended	OSR (HOTEL)	27 O'CONNELL STREET SYDNEY (RADISSON PLAZA HOTEL)

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



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. Impacts have been predicted for works required at night under Condition of Approval 23(a) and EPL Condition L5.8. The impact classification for these works is **low** given that there are no works to be completed outside of requirements of Condition of Approval 23(a) and EPL Conditions L5.8 and L5.9. 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

In conclusion, works associated with the Hunter Street Station OOH construction works for the Skinners Hotel Strengthening 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 DNVIS, consistent with the conditions of approval for the Project and the EIS.

Construction airborne noise

The predicted airborne noise levels indicate there are no construction noise affected residential and other sensitive receivers, from the OOH construction works assessed in this Addendum DNVIS, except for two hotels located near the works. The exceedances are less than 11 dB(A) above the NML. Actual levels should be verified to determine if construction noise levels exceed NML. Mitigation and management measures summarised in Section 9 of the DNVIS and specific mitigation measures outlined in Section 4.2 of this Addendum report will continue to be implemented during the Skinners Hotel Strengthening works.

Construction ground-borne noise and vibration

There are no vibration intensive activities required for these works. The likelihood of ground-borne noise and/ or vibration impact during OOH at Hunter Street West impact is assessed as **negligible**.

Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Reviewed / Authorised
26.06.2025	Initial issue	0	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.

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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 – Hunter Street Station, Sydney, 23 December 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 100dB The sound of a rock band 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 NCAs and noise management levels

B.1 NCAs and sensitive receiver identification

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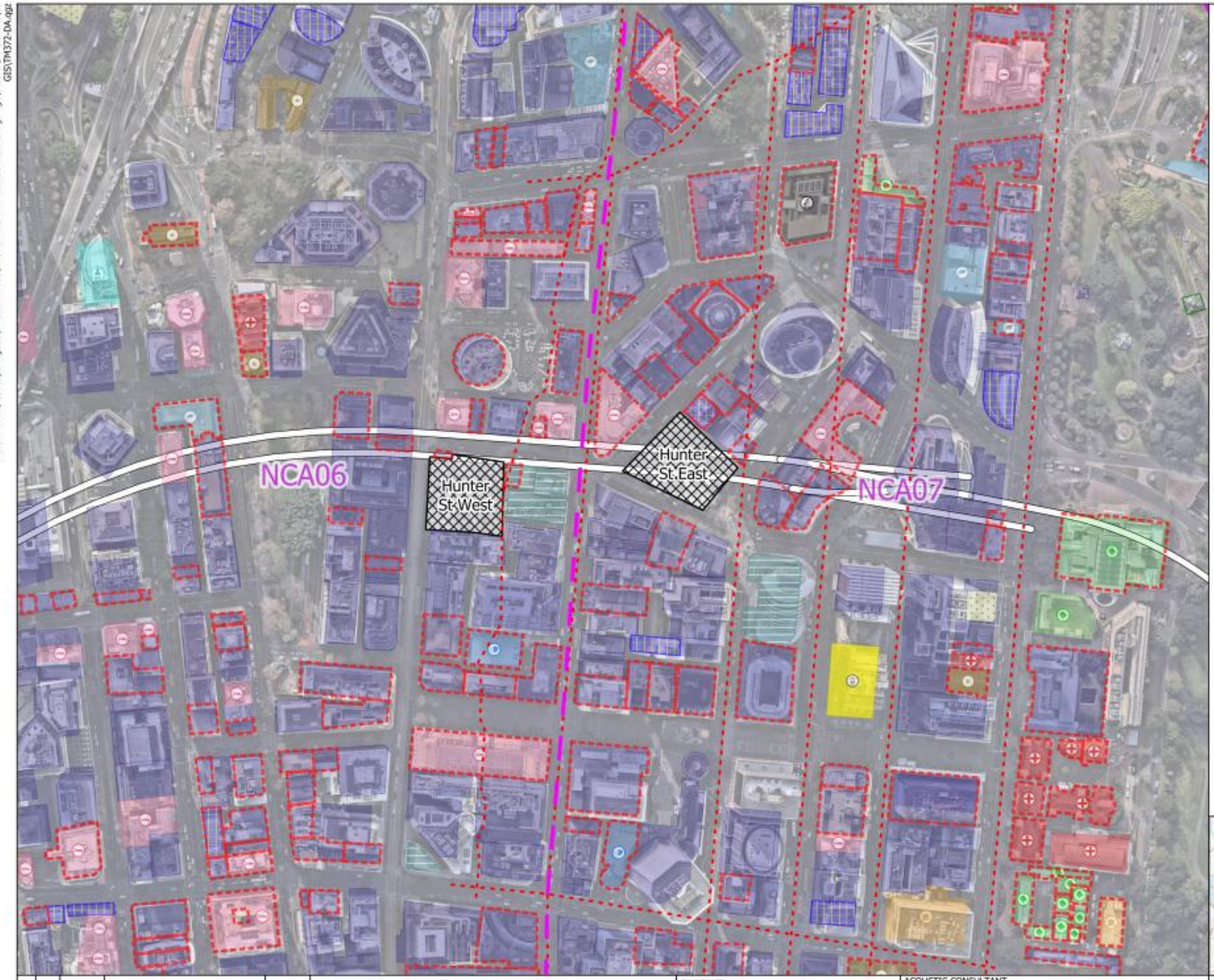
GIS File: R:\AssocSydProjects\TM351-TM400\TM372 mt SMW - Eastern Tunnelling Page\S Calcs\00 General\00 GIS\TM372-DA.qgz



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

0 30 60 90 120 150 m
1:3,000

A3 Original | Co-ordinate System: MGA Zone 56 | FULL SIZE A3 REDUCED TO A4 | NOTE: Do not scale from this drawing.

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

ction Noise Management Levels (airborne noise)

HUNTER STREET STATION

isting Noise Levels, dB(A)						Airborne NMLs based on ICNG (external)					Sleep Dist. L_{Amax}		Comments
L Day	RBL Evening	RBL Night	LAeq_D	LAeq_E	LAeq_N	NMLD(S)	NMLD(O)	NMLE	NMLN	NMLMS	$L_{Aeq(15min)}$	L_{AFmax}	
													Nearest worksite
	56	52	66	62	63	71	66	61	57	62	57	67	Hunter Street
	56	52	66	62	63	71	66	61	57	62	57	67	Hunter Street
						55	55	55	55	55	-	-	Source: ICNG Section 4.1.2 Table 3, assuming a conservative façade loss of 10 dB(A)
						65	65	65	65	65	-	-	Source: ICNG Section 4.1.2 Table 3, assuming a conservative façade loss of 20 dB(A)
						55	55	55	55	55	-	-	Source: ICNG Section 4.1.2 Table 3, assuming a conservative façade loss of 10 dB(A)
n)						60	60	60	60	60	-	-	Source: ICNG Section 4.1.2 Table 3
						65	65	65	65	65	-	-	Source: ICNG Section 4.1.2 Table 3
						70	70	70	70	70	-	-	Source: ICNG Section 4.1.3
						75	75	75	75	75	-	-	Source: ICNG Section 4.1.3
e)													
						70	70	70	-	-	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum', assuming 20 dB(A) facade loss
						-	-	-	60	60	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum', assuming 20 dB(A) facade loss
						60	60	60	60	60	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum', assuming 10 dB(A) facade loss
						55	55	55	55	55	-	-	Source: CNVS Section 2.2.1, assuming a conservative façade loss of 10 dB(A)
						65	65	65	65	65	-	-	Source: CNVS Section 2.2.1
						60	60	60	60	60	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum', assuming 10 dB(A) facade loss
						45	45	45	45	45	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum', assuming 20 dB(A) facade loss
						50	50	50	50	50	-	-	Source: AS2107 'maximum', assuming 20 dB(A) facade loss
						50	50	50	50	50	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum', assuming 20 dB(A) facade loss

y to Friday and from 8 am to 6 pm Saturday
Public holidays - OOHW P1
OHW P1
om 10 pm am to 8 am Saturday, Sunday and Public holidays - OOHW P2
, and from 06:00 to 08:00 Saturday, Sunday and Public holidays - OOHW P2

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ction Noise Management Levels (groundborne noise)

HUNTER STREET STATION

	Groundborne NMLs based on ICNG (internal)							Comments
	NMLDS	NMLDO	NMLE	NMLN	MS			
	(50)*	(50)*	40	35				Source: ICNG
	Human comfort vibration limit applies during the day. 50 dB(A) used as screening guideline.							
	45	45	45	45	45	-	-	Source: ICNG
	45	45	45	45	45	-	-	Source: ICNG
	45	45	45	45	45	-	-	Source: ICNG
	50	50	50	50	50	-	-	Source: ICNG, assuming a conservative façade loss of 20 dB(A)
	55	55	55	55	55	-	-	Source: ICNG, assuming a conservative façade loss of 20 dB(A)
use)								
	50	50	50	50	50	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum'
	40	40	40	40	40	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum'
	50	50	50	50	50	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum'
	45	45	45	45	45	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum'
	55	55	55	55	55	-	-	Source: CNVS Section 2.2.1, assuming a conservative façade loss of 10 dB(A)
	50	50	50	50	50	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum'
	25	25	25	25	25	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum'
	30	30	30	30	30	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum'
	30	30	30	30	30	-	-	Source: CNVS Section 2.2.1 & AS2107 'maximum'

to Friday and from 8 am to 6 pm Saturday
Public holidays - OOHW P1
OHW P1
om 22:00 to 08:00 Saturday, Sunday and Public holidays - OOHW P2
and from 06:00 to 08:00 Saturday, Sunday and Public holidays - OOHW P2

3 PROJECT
ERS HOTEL
GTHENING

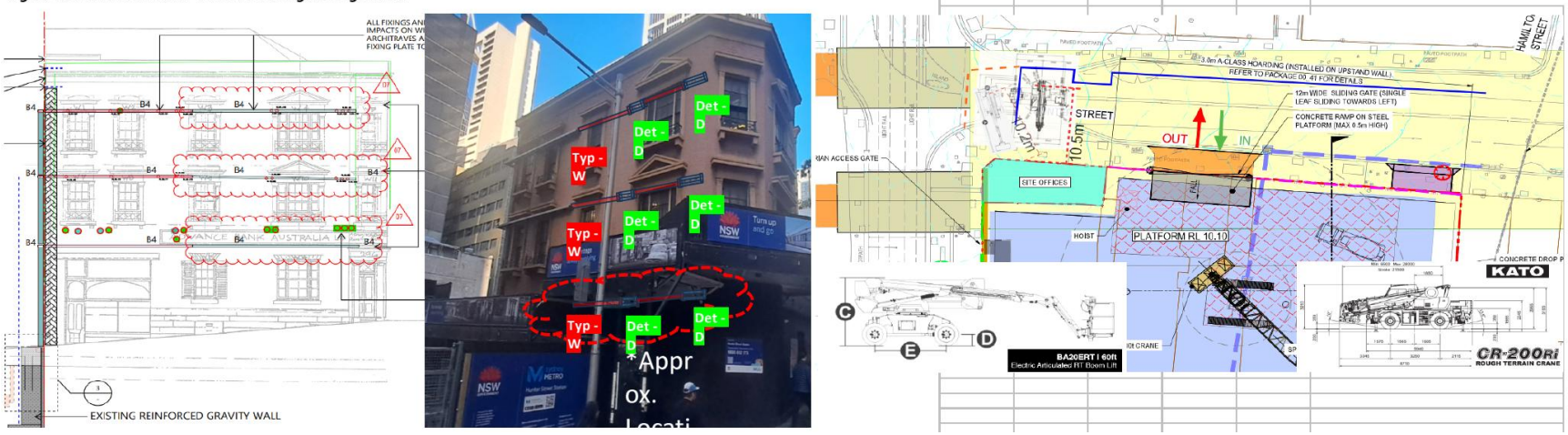
APPENDIX C Construction timetable/ activities/ management

C.1 Construction timetable/activities/equipment

Table C.1: Construction timetable/ activities/ equipment **HUNTER STREET STATION - WEST WOKSITE**

Activity/ Work Area	Aspect	Plant/ Equipment (as provided by client)	Day	Evening	Night	Timing of Activity		Sound Power Level (Lw re: 1pW) in Noise Model, dB(A)			High noise plant	Vibration intensive plant	Notes
			7am - 6pm	6pm - 10pm	10pm - 7am	Start Date	Duration	L_{Aeq}	Penalty	L_{Amax}			
Stage 1 Excavation	Skinner Hotel Strengthening (Northern Façade)	Boom Lift 45t	-	1	1	Jul-25	8 nights	95	-	98	-	-	
CoA D23(a)	*Assessment ref: HW-SHS*	Rattle gun (steel on steel)	-	1*	1*			107	-	118	-	-	* Used for 7.5min per 15min period.
EPL L5.8		Drill (standard)	-	1*	1*			106	-	108	-	-	* Used for 7.5min per 15min period.
		Handtool - Grinder	-	1*	1*			108	-	118	-	-	* Used for 7.5min per 15min period.
		Mobile crane	-	1	1			104	-	108	-	-	
		Welding equipment	-	1*	1*			96	-	107	-	-	* Used for 7.5min per 15min period.

Figure C.1: Works location - Skinners Strengthening Works



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 – Skinners Hotel Strengthening.	**Reviewed document reference:**	TM372-02-1-03D10 SMW-ETP_ADD_DNVIS-HUN-HSW-SHS (r01) Rev 1 dated 25 July 2025
Prepared by:	Larry Clark, Alternate Acoustics Advisor		
Date of issue:	30 July 2025		

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

The Addendum has been prepared to assess potential noise and vibration impacts from the Skinners Hotel Strengthening.

John Holland CPB Contractors Ghella Joint Venture (CPB) has advised that:

- A Road Occupancy Lease (ROL) necessary for the work was unable to be obtained for standard construction hours so works outside of standard construction hours (OOH) will be required
- Self-levelling EWPs will be considered for use as will non tonal safety alarms, to minimise potential noise impacts from extended activation of EWP tonal safety alarms
- Toolbox talks will include switching off EWP motors when the EWPs are stationary and not moving between locations to reduce noise emissions
- Torque wrenches (which are quieter than rattle guns) will be used after 10pm.

I'm satisfied that Revision 1 has adequately addressed my comments, and those of the Environmental Representative (ER) and Sydney Metro, and I endorse this addendum for implementation.

Larry Clark

Larry Clark, Metro West Alternate Acoustics Advisor