Laing O'Rourke

Central Station Main (CSM) Works

Construction Noise and Vibration Impact Statement (CNVIS)

November 2018

Revision 5

Reference: 0454833RP01

Environmental Resources Management Australia Pty Ltd
Level 15, 309 Kent Street
Sydney NSW 2000
Telephone +61 2 8584 8888
Facsimile +61 2 9299 7502
www.erm.com

CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

Assessment Overview

Environmental Resources Management Australia Pty Ltd (ERM) on behalf of Laing O'Rourke Australia Construction Pty Ltd (LOR) has completed a Construction Noise and Vibration Impact Statement (CNVIS) for relevant aspects of the Central Station Main (CSM) works (the CSM project). The CSM project and associated construction works are located in the rail corridor at and near Central Station and are being undertaken as part of the Sydney Metro City and Southwest project (Sydney Metro).

This report has been prepared to document the methodology, findings and recommendations of the CNVIS conducted for the CSM works. The CNVIS has been conducted with due regard to and in accordance with the New South Wales (NSW) policy and guidelines relevant to noise. The key documents which have been applied to this CNVIS include:

- *NSW Department of Environment and Climate Change – **NSW Interim Construction Noise Guideline** (ICNG), July 2009.*
- *NSW Government – Sydney Metro **Construction Noise and Vibration Strategy** (CNVS), August 2017.*
- *NSW Environment Protection Authority – NSW Environmental Noise Management – **Industrial Noise Policy** (INP), January 2000 and relevant application notes.*
- *NSW Department of Environment, Climate Change and Water – NSW **Road Noise Policy** (RNP), March 2011.*

This CNVIS considers the following acoustical factors: air-borne construction noise; ground-borne construction noise; road traffic noise during construction; and ground-borne construction vibration. Blasting activities and Tunnel Boring Machines (TBM) are not required for the CSM project and are therefore not addressed in this CNVIS.

The CNVIS report is technical in nature, a glossary of relevant acoustical concepts and terminology is provided in Annex A of this report.

Summary of Results

Fifty sensitive receptors were identified to be representative of the closest and/or potentially most affected locations situated within the potential area of influence of the CSM project. These locations do not represent all receptors located in the vicinity of the CSM works but have been selected for the purposes of this CNVIS; they are considered to be representative of locations that will experience the highest impacts associated with the CSM project.

Potential impacts associated with construction road traffic noise were qualitatively assessed and as outlined in the EIS, no impacts are anticipated. A quantitative construction noise and vibration impact assessment was then conducted by predicting noise levels via modelling and by estimating vibration and ground-borne noise levels.

*The predictions were conducted for applicable assessment scenarios (refer **Annex B**). Resultant noise levels were then compared to project-specific criteria or management levels at each receptor location and any exceedances identified. Resultant ground-borne noise and vibration levels were used to determine safe working distances at which project-specific criteria or management levels will not be exceeded.*

*A summary of the results and findings are presented in **Chapter 5 to Chapter 7** of this CNVIS. The full set of noise modelling results and findings are presented in **Annex C**. Although a number of exceedances are identified, these are associated with predicted 15 minute noise values calculated via modelling for the purposes of the assessment, in accordance with the ICNG and the Sydney Metro - Construction Noise and Vibration Strategy (CNVS). These values do not represent a constant noise emission that would be experienced by the community on a daily basis throughout the CSM project.*

Assessment Outcomes

Based on the findings of this CNVIS, recommendations have been made for noise and vibration mitigation, management measures and/or monitoring options suitable to the significance of the predicted impacts and designed to minimise impacts as far as is feasible and reasonable.

Where the predicted construction noise levels are above the ICNG noise management levels, the Additional Mitigation Measures Matrix (AMMM) identified in Section 8 of CNVS is to be implemented. The approach, guided by the AMMM, is primarily aimed at pro-active engagement with affected sensitive receptors rather than additional noise reducing mitigation.

*The types of additional mitigation measures include alternative accommodation, monitoring, individual briefings, letter box drops, project specific respite offers, phone calls and specific notifications. These vary depending on the level by which predicted noise values exceed the existing background noise levels, and the time of day as summarised in **Section 4.5** of this report.*

*Construction noise and vibration levels will be reduced and impacts minimised with the successful implementation of the recommendations provided in **Chapter 8** of this report. Impacts may not be reduced to negligible levels for all receptors during all construction activities; however the recommendations presented here will ensure that any residual impacts are minimised as far as is practically achievable. These recommendations will need to be implemented in conjunction with community and stakeholder consultation and notification processes.*

Prior to commencement of works, a Construction Noise and Vibration Management Plan (CNVMP) should be prepared and implemented in accordance with the requirements of the CNVS and this CNVIS. The CNVMP should take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where reasonable and feasible. At the time this CNVIS was prepared the CNVMP was also being developed to incorporate the recommendations of this assessment.

1 INTRODUCTION

Environmental Resources Management Australia Pty Ltd (ERM) on behalf of Laing O'Rourke Australia Construction Pty Ltd (LOR) has completed a Construction Noise and Vibration Impact Statement (CNVIS) for relevant aspects of the Central Station Main (CSM) works (the CSM project). The CSM project is located in and around Central Station, near the Sydney Central Business District (CBD) in New South Wales (NSW). This report has been prepared to document the methodology, results, findings and recommendations of the CSM project CNVIS.

1.1 PROJECT DESCRIPTION

Sydney Metro is a new standalone rail network identified in Sydney's Rail Future. The Sydney Metro network consists of Sydney Metro Northwest (previously known as the North West Rail Link) and Sydney Metro City and Southwest. A core component of Sydney Metro includes the Chatswood to Sydenham project. This involves construction and operation of an underground rail line, about 15.5 kilometres long, and new stations between Chatswood and Sydenham.

The CSM project involves the construction of new underground platforms below the existing suburban rail service platforms 12, 13, 14 and 15. The new platforms will be constructed using a cut-and-cover technique to create a cavern with an island platform. Access and egress from the new platforms will be via the existing northern station entry from Eddy Avenue, the main northern concourse and the existing paid underground pedestrian connections within Central Station.

The CSM project was assessed under the planning approval for the Sydney City Metro Chatswood to Sydenham that was approved by the Minister on 9 January 2017 under Part 5.1 of the Environmental Assessment & Planning Act 1979.

The Central station works include new infrastructure and the adjustments to existing infrastructure at Central Station to construct, operate and maintain the Metro Station Works. The key features of the Central Station Works include:

- A new north-south concourse for Central Station which will link the new metro station with the existing northern entrance and north concourse, a new east concourse, and the existing southern baggage tunnel.
- Adjustments to the existing Grand Concourse, Olympic Tunnel, north concourse and northern entrance to Central Station.

The Central walk works include the provision of other infrastructure to provide improved connectivity and other operational enhancements throughout Central Station. The key features of the Central walk works include:

- A new eastern entrance for Central Station.
- A new east concourse for Central Station beneath existing platforms 16 to 23, which will link the new eastern entrance, the new north south concourse, existing platforms 16 to 23 and the existing Eastern Suburbs Railway (ESR) concourse.
- Provisions to enable the future construction (by others) of an extension of the Central Walk through a new west concourse and a new western entrance for Central Station.

This CNVIS (conducted and documented with regard to the relevant policy, guidelines and standards listed in **Chapter 2** and the reference section of this report) addresses potential noise and vibration issues associated with the CSM works and applies directly to the CSM construction phase of Sydney Metro.

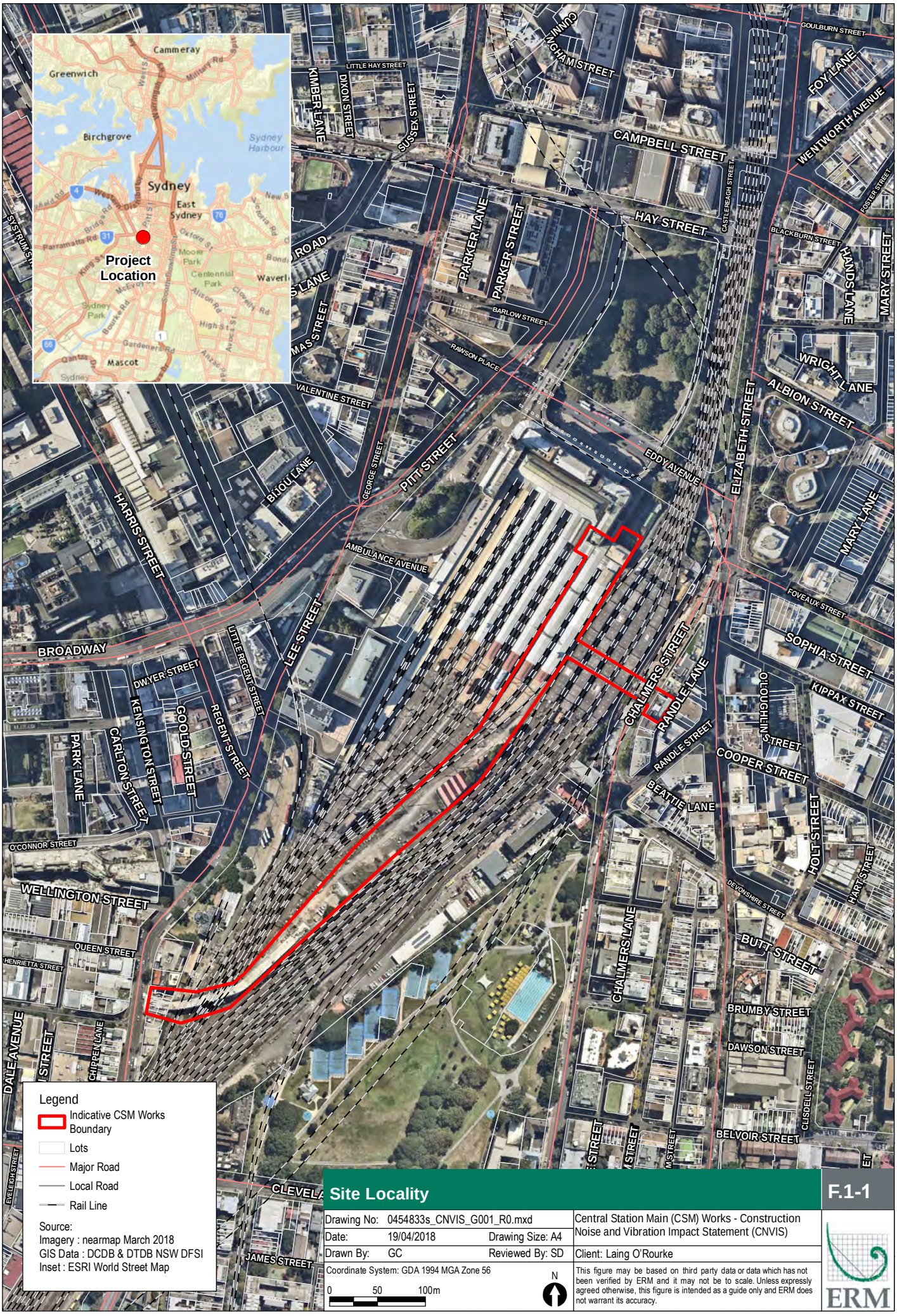
This CNVIS applies to all activities, tasks, products and services on the site over which it has control or influence. Blasting activities and Tunnel Boring Machines (TBM) are not required for the CSM project and are therefore not addressed in this CNVIS.

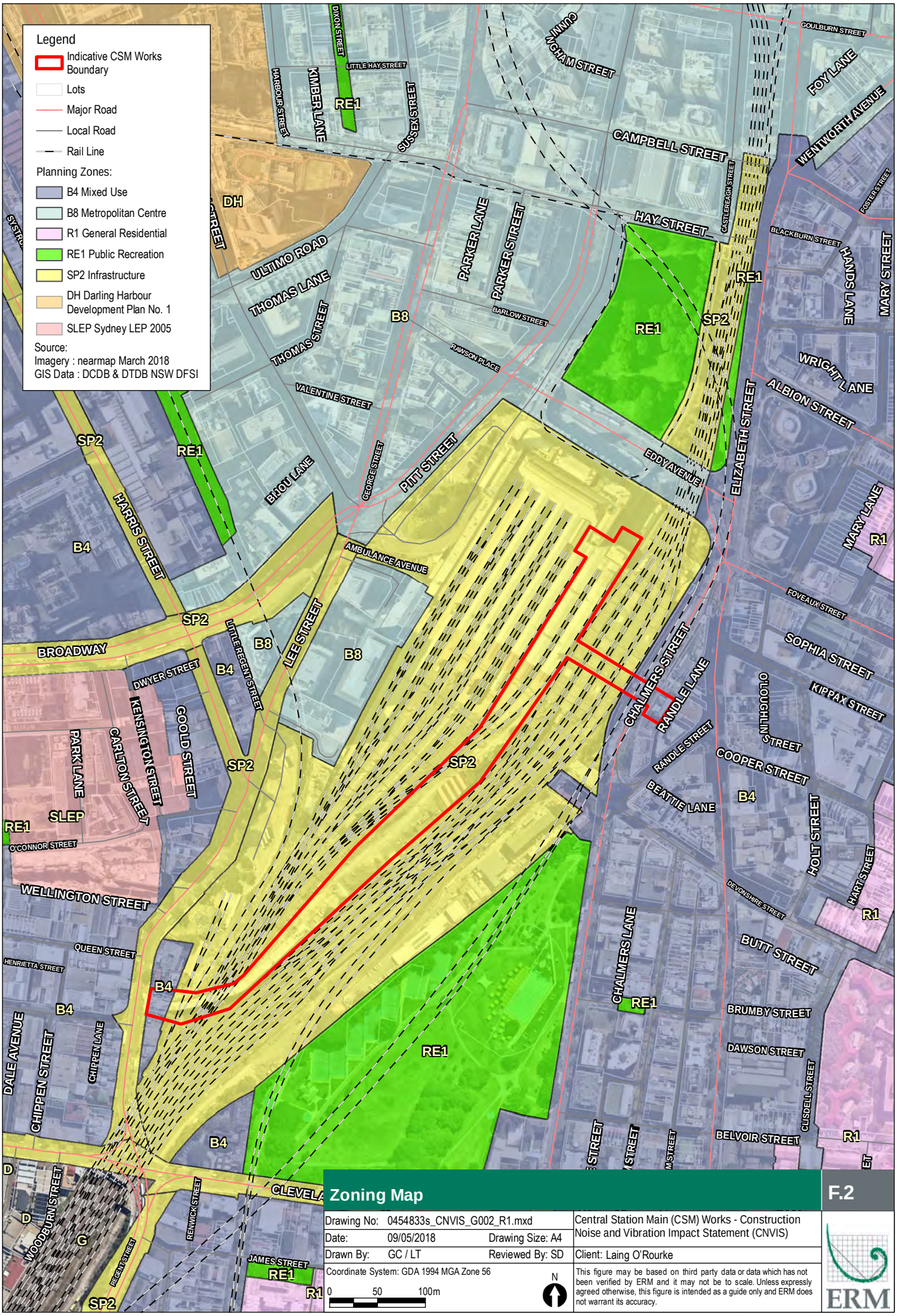
The CSM works will include demolition, earthworks and construction of all permanent new infrastructure and modifications to existing infrastructure. The CSM scope and potential noise and vibration issues associated with the works are outlined below and detailed further in the overall Construction Environment Management Plan (CEMP) and the Construction Noise and Vibration Management Plan (CNVMP).

1.2 PROJECT SITE SETTING

The area surrounding the CSM project is made up of high density residential and commercial land uses that are zoned as metropolitan centre and mixed use under the Sydney Local Environmental Plan (SLEP).

The location of the CSM project site and other items of importance to this CNVIS are illustrated in **Figure 1.1** to **1.3** below. Due to the large project site area and density of potentially sensitive receptors surrounding the CSM project,
Figure 1.3 has then been divided into three key areas (refer **Figure 1.3A** to **1.3C**) to document other features and detail, as relevant to the assessment.


Project Location
Cammeray
Greenwich
Birchgrove
Sydney
East Sydney
Mascot
Sydney Harbour
Legend
Indicative CSM Works Boundary
Lots
Major Road
Local Road
Rail Line
Source:
Imagery : nearmap March 2018
GIS Data : DCDB & DTDB NSW DFSI
Inset : ESRI World Street Map
CAMPBELL STREET
HAY STREET
PARKER STREET
PARKER LANE
CASTLEREAGH STREET
GOULBURN STREET
FOY LANE
WENTWORTH AVENUE
FOSTER STREET
BLACKBURN STREET
HANDS LANE
MARY STREET
WRIGHT LANE
ALBION STREET
ELIZABETH STREET
MARY LANE
FOVEAUX STREET
SOPHIA STREET
KIPPAX STREET
O'LOUGHLIN STREET
COOPER STREET
BEATTIE LANE
HOLT STREET
HART STREET
DEVONSHIRE STREET
BUTT STREET
BRUMBY STREET
DAWSON STREET
CLISDELL STREET
BELVOIR STREET
CHALMERS LANE
CHALMERS STREET
RANDLE LANE
RANDLE STREET
EDDY AVENUE
PITT STREET
GEORGE STREET
BIJOU LANE
HARRIS STREET
AMBULANCE AVENUE
LEE STREET
BROADWAY
DWYER STREET
LITTLE REGENT STREET
REGENT STREET
GOOLD STREET
KENSINGTON STREET
CARLTON STREET
PARK LANE
O'CONNOR STREET
WELLINGTON STREET
QUEEN STREET
HENRIETTA STREET
DALE AVENUE
CHIPPEN LANE
EVELEIGH STREET
CLEVELAND STREET
JAMES STREET
VALENTINE STREET
RAWSON PLACE
BARLOW STREET
MAS STREET
ROAD
LANE
KIMBER LANE
DIXON STREET
LITTLE HAY STREET
SUSSEX STREET
GUNNING STREET
Site Locality
F.1-1
Drawing No: 0454833s_CNVIS_G001_R0.mxd
Date: 19/04/2018
Drawing Size: A4
Drawn By: GC
Reviewed By: SD
Coordinate System: GDA 1994 MGA Zone 56
0 50 100m
N
Central Station Main (CSM) Works - Construction Noise and Vibration Impact Statement (CNVIS)
Client: Laing O'Rourke
This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.
ERM



Zoning Map

F.2

Drawing No:	0454833s_CNVIS_G002_R1.mxd		Central Station Main (CSM) Works - Construction Noise and Vibration Impact Statement (CNVIS)
Date:	09/05/2018	Drawing Size: A4	
Drawn By:	GC / LT	Reviewed By: SD	Client: Laing O'Rourke

Coordinate System: GDA 1994 MGA Zone 56

0 50 100m

N

ERM

Overview of Potentially Sensitive Receptors and Noise Logging Locations

F.1-3

Drawing No:	0454833s_CNVIS_G003_R0.mxd		Central Station Main (CSM) Works - Construction Noise and Vibration Impact Statement (CNVIS)
Date:	20/04/2018	Drawing Size: A4	
Drawn By:	GC	Reviewed By: SD	Client: Laing O'Rourke

Coordinate System: GDA 1994 MGA Zone 56

0 50 100m

N

This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

ERM

Potentially Sensitive Receptors - Detail NW

F.1-3A

Drawing No:	0454833s_CNVIS_G004_R0.mxd		Central Station Main (CSM) Works - Construction Noise and Vibration Impact Statement (CNVIS)
Date:	20/04/2018	Drawing Size: A4	
Drawn By:	GC	Reviewed By: SD	Client: Laing O'Rourke

Coordinate System: GDA 1994 MGA Zone 56

ERM

Potentially Sensitive Receptors - Detail NE

F.1-3B

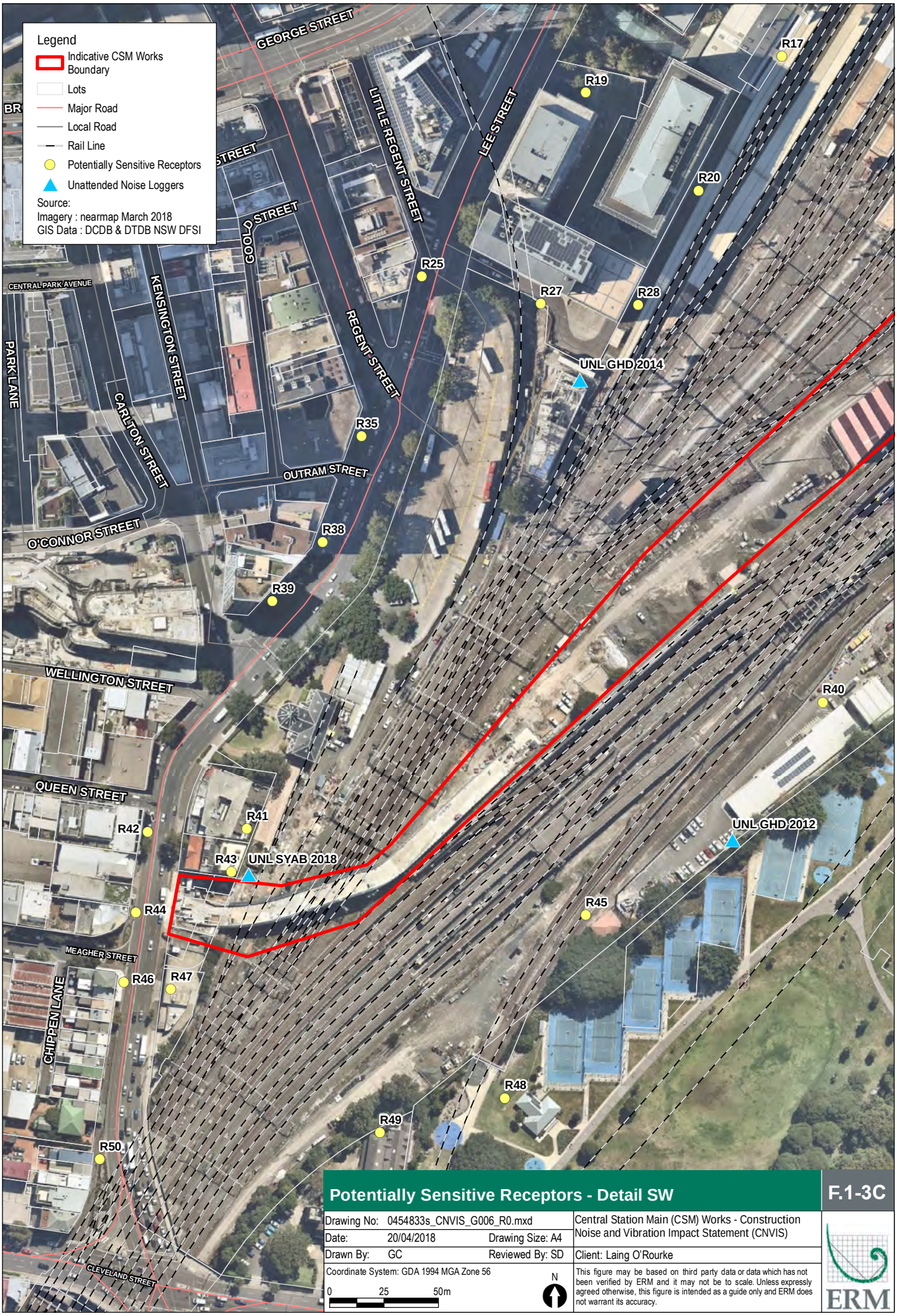
Drawing No:	0454833s_CNVIS_G005_R0.mxd		Central Station Main (CSM) Works - Construction Noise and Vibration Impact Statement (CNVIS)
Date:	20/04/2018	Drawing Size: A4	
Drawn By:	GC	Reviewed By: SD	Client: Laing O'Rourke

Coordinate System: GDA 1994 MGA Zone 56

0 25 50m

N

ERM



Potentially Sensitive Receptors - Detail SW

F.1-3C

Drawing No:	0454833s_CNVIS_G006_R0.mxd		Central Station Main (CSM) Works - Construction Noise and Vibration Impact Statement (CNVIS)
Date:	20/04/2018	Drawing Size: A4	
Drawn By:	GC	Reviewed By: SD	Client: Laing O'Rourke

Coordinate System: GDA 1994 MGA Zone 56

ERM

Potentially Sensitive Receptors - Detail SE

F.1-3D

Drawing No:	0454833s_CNVIS_G007_R0.mxd		Central Station Main (CSM) Works - Construction Noise and Vibration Impact Statement (CNVIS)
Date:	20/04/2018	Drawing Size: A4	
Drawn By:	GC	Reviewed By: SD	Client: Laing O'Rourke

Coordinate System: GDA 1994 MGA Zone 56

0 25 50m

N

ERM

2 ASSESSMENT METHODOLOGY

Nuisance, or an unacceptable level of noise and vibration amenity, may arise from construction activities associated with new or existing developments.

These potential environmental issues are common to larger scale construction works and in this case are recognised in the broader Sydney Metro project approval documents requiring the preparation of this CNVIS, and the mitigation and management of potential impacts during the approved works and activities. This CNVIS has been conducted and documented to address these potential issues and applies directly to the CSM construction phase of Sydney Metro. It applies only to construction activities, tasks, products and services on the site over which LOR has control or influence.

On this basis, this CNVIS considers the following acoustical factors:

- Air-borne construction noise;
- Ground-borne construction noise;
- Road traffic noise during construction; and
- Ground-borne construction vibration.

Blasting was not considered for the CSM project as it was not suitable for the construction methods adopted. Blasting activities and Tunnel Boring Machines (TBM) are not required for the CSM project and are therefore not addressed in this CNVIS. The conditions of approval (CoA) specifically relating to blasting and TBM do not apply to the CSM project.

All sound pressure levels presented in this report (e.g. noise levels predicted at a receptor) are in decibels referenced to 2×10^{-5} Pa. All sound power levels presented in this report (e.g. noise levels assigned to specific sources) are decibels referenced to 10^{-12}W. A glossary of relevant acoustical concepts and terminology is provided in **Annex A**.

2.1 SCOPE OF WORK

To assess CSM construction noise and vibration (including road traffic), the following scope of work has been completed:

- Review and validate the available project and third party data and information as considered relevant to the CNVIS.
- Review aerial photography, zoning data, cadastre data and third party assessments conducted in the area to identify potential residential and other sensitive receptors situated within the potential area of influence of the CSM project works.

- Identify significant (air-borne and ground-borne) noise and vibration generating plant, equipment and machinery that may be in use or activities that will be undertaken as part of the CSM project works and their likely/known emissions to develop applicable assessment scenarios.

- Review and validate third party assessments conducted in the area to establish representative baseline noise levels for the area and then develop project-specific noise and vibration criteria in accordance with recognised NSW policy and guidelines as applicable to project activities.

- Complete a quantitative assessment of key acoustical factors including potential noise and vibration impacts associated with construction aspects of the CSM project. The quantitative assessment was completed by predicting project noise levels (via modelling where possible) for the scenarios developed, with vibration predicted via spreadsheet calculations. A qualitative assessment of low risk acoustical factors was also completed.

- Provide a comparison of predicted levels to the project-specific noise and vibration criteria at receptors, identify any levels that exceed criteria and determine the magnitude and extent of any impacts.

- Recommend mitigation, management measures and/or monitoring options suitable to the predicted levels and designed to minimise impacts as far as is feasible, reasonable and practicable to implement. LOR reviewed these recommendations and is committed to implementing the specified measures during the CSM project, as documented in the CNVMP.

It is noted that at the time this CNVIS was prepared a CNVMP was also being prepared to outline the Central Station Main Works (CSM) Project's approach to ensure all risks associated with noise and vibration issues are considered and managed effectively and in accordance with Project's legal, planning and contractual requirements.

2.2 POLICY SETTING

In NSW, noise pollution is regulated through the *Protection of the Environment Operations Act 1997* (POEO Act) as the key piece of environment protection legislation. Noise pollution is defined under the POEO Act as:

'*the emission of offensive noise, which means noise that by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances, is harmful (or is likely to be harmful) to or interferes unreasonably (or is likely to interfere unreasonably) with the comfort or repose of a person outside the premises from which the noise is emitted*'.

Various noise and vibration assessment guidelines endorsed by NSW regulators provide a guideline framework and methodology for deriving

acceptable levels and standard methods for assessing and measuring construction impacts with due regard to the POEO Act.

The key documents, policy, guidelines and standards relevant to the CSM project works are summarised below.

This CNVIS has been developed to address the requirements of the Critical State Significant Infrastructure Conditions of Approval (CoA) (SSI 15_7400) and the requirements of the Sydney Metro Construction Environmental Management Framework (August 2016).

CoA - E33 outlines the requirement for Construction Noise and Vibration Impact Statements to be prepared for each construction site prior to noise and vibration impacts occurring and include specific mitigation measures identified through consultation with affected sensitive receptors. Please refer to Annex E for the Consultation Register.

2.2.1 Relevant Policy, Guidelines and Standards

This CNVIS has been conducted with due regard to and in accordance with the following key policy, guidelines and standards:

- NSW Department of Environment and Climate Change – *NSW Interim Construction Noise Guideline* (ICNG), July 2009.
- NSW Government – Transport for NSW (TfNSW) - *Sydney Metro Construction Noise and Vibration Strategy* (CNVS), August 2016 and CNVS Addendum August 2017.
- NSW Environment Protection Authority – *NSW Environmental Noise Management – Industrial Noise Policy* (INP), January 2000 and relevant application notes.
- NSW Department of Environment, Climate Change and Water – *NSW Road Noise Policy* (RNP), March 2011.
- NSW Government – Transport for NSW (TfNSW) – *Construction Noise Strategy* (CNS), April 2013.
- Standards Australia AS 2436–2010™ (AS2436) – *Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites*.
- Standards Australia AS1055–1997™ (AS1055) – Description and Measurement of Environmental Noise.
- Standards Australia AS IEC 61672.1–2004™ (AS61672) – *Electro Acoustics - Sound Level Meters Specifications Monitoring* or Standards Australia AS1259.2-1990™ (AS1259) – *Acoustics – Sound Level Meters – Integrating/Averaging* as appropriate to the device.

- Standards Australia AS/IEC 60942:2004/IEC 60942:2003 (IEC60942) – Australian Standard™ – *Electroacoustic – Sound Calibrators*.

- German Institute for Standardisation – DIN 4150 (1999-02) Part 3 (DIN4150:3) – *Structural Vibration - Effects of Vibration on Structures*.

- British Standard BS7385: Part 2-1993 (BS 7385) - *Evaluation and Measurement for Vibration in Buildings — Part 2 – Guide to Damage Levels from Ground-borne Vibration*, dated 1993.

- NSW Department of Environment and Conservation – *NSW Environmental Noise Management – Assessing Vibration: a Technical Guideline* (the NSW Vibration Guideline), February 2006.

NSW Interim Construction Noise Guideline (DECC 2009)

The ICNG presents an accepted method by which construction noise and vibration impacts may be assessed for a range of receptor types for works completed in NSW. It provides as set of recommended standard hours of construction, as reproduced below:

- Monday to Friday: 7 am to 6 pm;

- Saturday: 8 am to 1pm; and

- No work on Sundays or public holidays.

The ICNG encourages works to occur within the recommended standard hours of construction unless justification is provided. It focuses on minimising construction noise impacts, rather than only on achieving numeric noise levels, and recognises that some noise from construction sites is inevitable.

The ICNG encourages organisations involved with construction, maintenance or upgrading works (e.g. large scale contractors or Government agencies) to develop their own best-practice techniques for managing construction noise and vibration, and implementing feasible and reasonable mitigation measures.

In this case the ICNG (in conjunction with other project-specific noise and vibration strategy documents) is considered the suitable document to quantifiably assess potential noise emissions and impacts associated with project construction.

Sydney Metro Construction Noise and Vibration Strategy (CNVS)

As noted above, the ICNG guideline encourages organisations involved with construction, maintenance or upgrading works (such as Sydney Metro) to develop their own best-practice techniques for managing construction noise.

In line with this recommendation the purpose of this 'Construction Noise and Vibration Strategy' is to document how Sydney Metro proposes to manage construction noise and vibration for the Sydney Metro City and Southwest project including any potential extensions.

Generally the strategy is intended to provide a single interface for the large number of policies, guidelines, standards and regulations that apply to a large infrastructure project such as Sydney Metro. Where possible the strategy consolidates these information sources e.g. vibration criteria from numerous sources are collated into one section of this strategy for ease of reference. Further, the strategy aims to provide interpretation of the reference documents which are specific to the Metro project. Where the reference documents are found to have insufficient detail the strategy provides additional assessment criteria and methodologies.

NSW Industrial Noise Policy (EPA 2000)

Responsibility for the control of noise emissions in NSW is typically vested in Local Government and the NSW Environment Protection Authority (EPA). The INP and relevant application notes provide a framework and methodology for deriving limit conditions for consent and licence conditions.

The INP is designed for large and complex industrial sources and outlines processes designed to strike a feasible and reasonable balance between the operations of industrial activities and the protection of the community from noise levels that are intrusive or unpleasant.

The INP measurement and evaluation methodology to quantify existing ambient and background noise levels has been adopted for this CNVIS, with the baseline values utilised to derive construction noise criteria. The INP assessment terminology is outlined in more detail in **Annex A** of this report.

NSW Road Noise Policy (DECCW 2011)

The RNP was approved to replace the Environmental Criteria for Road Traffic Noise (ECRTN) with effect from 1 July 2011. The RNP outlines the range of measures needed to minimise road traffic noise and its impacts. It is intended for use by acoustics specialists as well as:

- Road project proponents.
- Determining authorities and regulators involved in the approval and construction of road projects and land use developments that generate additional traffic on existing roads.
- City and transport planners and policymakers dealing with issues such as route corridors, heavy vehicle transport and building codes.

The RNP aims to identify the strategies that address the issue of road traffic noise from existing roads, new road projects, road redevelopment projects and new traffic-generating developments. In this case the RNP is considered the

suitable document to qualitatively assess potential noise emissions and impacts associated with construction road traffic.

The RNP vary based on road type and are dependent on the development being assessed (refer **Section 4**). The criteria values from the RNP were considered in the assessment of potential construction impacts, they are used to provide guidance on potential short-term and temporary impacts associated with heavy vehicle haulage and/or other like vehicles that may be required as part of the construction.

Vibration Guidelines and Standards

For the purposes of this CNVIS, the effects of vibration in buildings can be divided into three main categories: human comfort (annoyance), building damage (cosmetic/structural) and sensitive equipment (scientific/medical). An overview of the applicable standards and guidelines is provided below.

Human Comfort (annoyance): The NSW Vibration Guideline provides guidance for assessing human exposure (comfort or annoyance issues) to vibration. The publication is based on British Standard (BS 6472–1992) – *Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz*), dated 1992.

Cosmetic and Structural Damage: There is currently no Australian policy or guideline for assessing the potential for building damage (cosmetic and structural**)** from vibration. To achieve the requirements of the CNVS, British Standard BS 7385 Part 2-1993 'Evaluation and measurement for vibration in buildings Part 2' has been considered for CSM project works where applicable. BS 7385 provides safe limit guideline values, below which vibration is considered insufficient to cause structural or cosmetic damage to buildings. If a heritage building or structure is found to be structurally unsound a more conservative standard has been adopted i.e. German Standard DIN4150 Part 3-1999 (DIN4150-3) – *Structural Vibration - Effects of Vibration on Structures,* dated 1999. DIN4150-3 presents a set of safe limit values that below which cosmetic or structural damage is unlikely to occur.

The NSW Vibration Guideline, BS7385 and DIN 4150-3 criteria vary based on vibration type, receptor type and are dependent on the component frequency of the vibration event (refer **Section 4.4**). The criteria values from the NSW Vibration Guideline, BS7385 and DIN 4150-3 were considered in the assessment of potential impacts but are not reproduced here.

Sensitive Scientific and Medical Equipment: Some scientific equipment (e.g. electron microscopes and microelectronics manufacturing equipment) can require more stringent objectives than those applicable to human comfort.

Where manufacturer's data for the identified vibration sensitive scientific and/or medical instruments is not available, generic vibration criterion (VC)

curves as detailed in the CNVS and presented **Section 4.4** will be adopted as vibration goals.

2.3 NOISE MODELLING (AIR-BORNE CONSTRUCTION NOISE)

The methodology, inputs and assumptions that have informed the construction and operational noise modelling are outlined below:

- Brüel and Kjær's Predictor 7810 (Version 12) noise modelling software package was utilised to calculate noise levels using the International Organisation for Standardisation (ISO) 9613-2:1996 (ISO9613:2) - *Acoustics - Attenuation of Sound during Propagation Outdoors - Part 2: General Method of Calculation* noise propagation algorithms (international method for general purpose, 1/1 octaves).

- For sound calculated using ISO9613:2, the indicated accuracy is ±3dBA at source to receiver distances of up to 1000 metres (m) and unknown at distances above 1000m.

- The Predictor software package allowed 3D elevation data to be combined with ground regions, water, foliage, significant building structures etc. and receptor locations, to create a detailed and accurate representation of the site and surrounding area. The noise model allowed for the quantification of noise levels from multiple sources, based on sound power or pressure levels emitted from each source. The model computed the noise propagation in the assessment area of influence to specifically quantify A-weighted decibels ($L_{eq, 15minute}$ in dBA) at identified receptors.

- Sound Power Level (LW, dBA) data incorporated into the project-specific noise models was provided by the client, obtained from relevant Australian Standards or adapted from a proprietary source term database available at the time of the assessment. This assessment has considered standard good practice mitigation measures via noise modelling by adopting the midpoint values for all sound power levels.

    - LW is a measure of the total power radiated by a source; it is a fundamental property of the source and is independent of the surrounding environment.

    - LW differs from a Sound Pressure Level (LP) which is the level of sound pressure as measured at a distance by a standard sound level meter with a microphone. LP is the received sound (e.g. Leq, 15minute in dBA) as opposed to LW which is the sound 'intensity' at the source.

- 3D elevation data, zoning data and cadastre (spatial data) was obtained from the NSW Government - Land and Property Information (LPI).

- Buildings near the CSM project were included in the noise model based on this spatial data or manually digitised from aerial photography.

- They were modelled as building regions for the broader areas surrounding the CSM project but were included as specific buildings for those in close proximity to the site.

- Potentially sensitive receptor locations, were identified (detailed in **Section 3.1**) to assess construction noise impacts. These locations were selected to ensure the most affected points were assessed. The receptor locations adopted for this assessment were presented in **Figures 1.1 to 1.3D**.

- Noise levels were calculated at 1.5 metres (m) above ground level for all receptors, in accordance with the INP and ICNG. It is noted that ambient, background and project noise levels may be higher at receptor heights above 1.5 m.

- In all cases noise has been assessed at the most-affected point at or within the residential property boundary or, if that is more than 30 m from the residence, at the most-affected point within 30 m of the residence.

- The model included a temperature of 15°C and humidity of 60%, representative of typical Sydney conditions. Further information is provided below regarding prevailing meteorological conditions. A ground factor of 0.4 was adopted for the modelling area (0.0 is hard, 1.0 is soft).

- Amongst other features noise modelling software offer a range of emission source types to be used to predict levels at receptors, these include but are not limited to "area sources" and "point sources". These source types were adopted as follows:

  - To accurately represent general construction emissions, capturing the size, layout and number of noise generating plant / equipment, "area sources" were utilised to predict $L_{eq, 15minute}$ noise levels. A separate area source was placed in the model for each phase of works to represent the distribution of noise across the broader project site during each work phase.

  - "Moving Sources" were included in the noise model for the heavy vehicle movements (inbound and outbound) over the Sydney Yard Access Bridge (SYAB). The assessment of heavy vehicle movements over the SYAB has been assessed as a separate scenario to isolate these impacts. It should be noted that heavy vehicle movements over the SYAB will occur throughout various phases of work.

- The noise assessment scenarios and modelling data are summarised in **Section 3.3** and presented in detail in **Annex B**. All L_W, dBA values have

considered and applied the relevant INP modifying factors (penalties) for offensive noise characteristics, prior to modelling.

2.3.1 Prevailing Meteorological Conditions

Prevailing meteorological conditions have the potential to increase noise levels at receptors influenced by the effects of wind and temperature inversions. Winds blowing between the source and the receptor, and temperature inversions can increase noise levels by between 1 dBA and approximately 7 dBA depending on the distance of the receptor from the source and condition. These noise level increases are normally detectable (or quantifiable via modelling) for receptor distances greater than 100 metres from the source.

For this construction noise model meteorological conditions for prevailing winds were not included in the model however a D-Class temperature inversion was adopted (representing a standard meteorological condition) for all scenarios.

Although other receptors are situated at distances further from the site that could be influenced by the effects of other wind and inversion conditions, compliance at the closest receptors and further attenuation provided by intervening building structures and topography will ensure compliance at other receptors.

2.4 CUMULATIVE IMPACTS

Noise impact assessments are generally based on predicting project-specific levels at the closest and/or most affected receptors and then comparing these to criteria or management levels that apply to the type of emission being considered. To assess potential cumulative impacts a varied approach has been adopted as described below.

The construction noise criteria (ICNG) and management levels are based on both fixed values identified in the ICNG and existing noise levels measured at locations surrounding the site. The ICNG management levels focus on the direct impacts from the site under assessment, cumulative impacts are beyond the control of LOR, are temporary in most circumstances and are best managed by local or state consent authorities for significant projects. Therefore, a qualitative assessment of potential cumulative impacts has been conducted but limited discussion regarding cumulative impacts is required.

The road traffic noise criteria (RNP) are fixed values but are derived to assess the site noise level contribution (i.e. project vehicles on public roads) and the effects of cumulative road traffic noise impacts. Therefore, the RNP criteria address potential cumulative impacts without further discussion required.

The vibration criteria (the NSW vibration guideline and DIN4150-3) are again fixed values derived to assess the site vibration level contribution, cumulative impacts will unlikely occur in most circumstances due to the lack of impact from existing influential sources. In addition the CNVS provides a conservative vibration damage screening level per receiver type is given below:

- Reinforced or framed structures: 25.0 mm/s
- Unreinforced or light framed structures: 7.5 mm/s

At locations where the predicted and/or measured vibration levels are greater than shown above (peak component particle velocity), a more detailed analysis of the building structure, vibration source, dominant frequencies and dynamic characteristics of the structure would be required to determine the applicable safe vibration level. This analysis would also consider any cumulative impacts from existing vibration sources.

Where vibration sensitive scientific and/or medical instruments are likely to be in use inside an identified vibration sensitive receptor. Background vibration monitoring may be required in combination with the manufacturer or CNVS criteria to establish a specific screening criteria. Cumulative impacts from existing vibration sources would be considered in the development of this screening criteria.

Therefore, a qualitative assessment of potential cumulative impacts from vibration has been conducted but limited discussion regarding cumulative impacts is required.

With the above features in mind cumulative impacts associated with nearby construction works (e.g. Sydney Light Rail and Sydney Trains maintenance) will be managed through the community consultation process. Sydney trains take the lead on communications that are occurring within Sydney Train land and LOR project works will be included as a combined notification. Further detail of the community consultation process are detailed in the overarching Stakeholder and Community Involvement Plan (Sydney Metro Community Consultation Strategy).

2.5 *VIBRATION ASSESSMENT*

To assess potential vibration impacts a combined approach of guideline reference and predictive methods was adopted.

The guideline reference involved the applicable safe work distances published in the TfNSW CNS. The predictive method adopted the Table E.1 empirical predictors for ground-borne vibration arising from mechanized construction works as presented in British Standard – BS5228-2:2009+A1:2014 (BS5228) – *Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration.*

BS 5228 presents methods to estimate vibration due to vibratory piling, which in this case has been selected to best represent the sheet piling activity. A conservative method has been applied based on the specified calculative inputs and distance offsets to estimate potential vibration levels, PPV in mm/s. All calculative inputs are summarised in **Table 2.1**. Due to the predictive method adopted of predicting vibration there is an inherent level of uncertainty associated with predicted levels. Therefore vibration monitoring will be required at the commencement of vibration generating activities to confirm that vibration levels satisfy the criteria for that vibration generating activity.

Predicted values have been used to determine safe working distances for vibration generated from the sheet piling activity. The predicted values are estimates only and may vary depending on geotechnical features and intervening structures, amongst other things. In ERM's experience these predicted values are typically conservative but offer a useful guide for the purpose of assessing impacts, evaluating mitigation and management measures and defining monitoring requirements.

Table 2.1 Sheet Piling (Vibratory Piling) Calculative Inputs

Operation	Prediction question	Scaling Factors (and probability of predicted value being exceeded)	Parameter range
Vibratory Piling	$v_{res} = \frac{k_v}{x^{\delta}}$	k_v = 60 (50%) k_v = 126 (33.3%) k_v = 266 (5%)	1 ≤ x ≤ 100 m δ = 1.3 (all operations) δ = 1.2 (start-up/run down) δ = 1.4 (steady state)

Source: BS 5228

It should be noted that the Central Station buildings have been identified as state significant heritage structures in close proximity to the site and in addition to this assessment, monitoring will be required in the early stages of work to confirm that vibration levels satisfy the cosmetic damage criteria outlined in **Section 4.4** of this report, in accordance with the CNVS.

Sheet piling was the selected methodology due to the constraints of the site. It was also considered the most efficient way to achieve this activity in accordance with project schedule. It should be noted that if vibration is identified as an issue during vibration monitoring of this activity, adaptive construction management measures will be adopted at the time to ensure impacts are managed appropriately.

As outlined in **Section 4.4**, some scientific equipment can require more stringent objectives than those applicable to human comfort. As there is a potential for some scientific/medical equipment in the Dental Hospital located on Chalmers Street, further investigation will be required prior to vibration intensive activities occurring in the vicinity of the Dental Hospital.

Baseline vibration measurements will therefore be undertaken at receptors that are identified to contain sensitive scientific / medical equipment prior to construction activities being undertaken. The baseline data in combination with the VC curves presented in **Table 4.6** will be used to determine project / equipment specific vibration criteria.

2.6 GROUND-BORNE NOISE ASSESSMENT

Unlike air-borne noise (refer **Section 2.3**), there is no specialised modelling software packages readily available that are capable of predicting vibration and resultant ground-borne noise. In the absence of specialised software it is common acoustics practice to therefore predict ground-borne noise via spreadsheet calculations.

These calculations are generally based on either a) calculative methods defined by international standards e.g. BS 5228:2, or b) calculative methods based on measured data and resultant site laws, trends or slant distances, adapted for select activities. These spreadsheet methods provide an understanding of potential emissions but do not incorporate modelling features such as elevation data, ground regions, water, foliage, significant building structures etc that typically reduce predicted values over distance. With regards to vibration and resultant ground-borne noise these limitations often provide for conservative (often highly conservative) results, as the predictions avoid accounting for differing substratum conditions which affects and commonly reduces how vibration propagates between the source and the receptor.

As a result there is an inherent level of uncertainty associated with predicted ground-borne noise such that providing a set of provisions, safeguards and monitoring contingencies is a feature of the CNVMP. These measures are outlined in Section 10.2.4 of the CNVMP.

As outlined in the TfNSW - Sydney Metro - Chatswood to Sydenham **Environmental Impact Statement (EIS) – Technical Paper 2 Noise and Vibration**, Prepared by SLR, dated April 2016, the highest potential ground-noise impacts are associated with Tunnel Boring Machines (TBMs), Roadheaders and Rock Breakers. To assess potential ground-borne noise impacts, safe work distances have been determined utilising the indicative ground-borne noise levels identified in the EIS, for Tunnel Boring Machines (TBMs), Roadheaders and Rock Breakers. These safe-work distances have then been used to determine exceedances of the NMLs and therefore any requirements for mitigation.

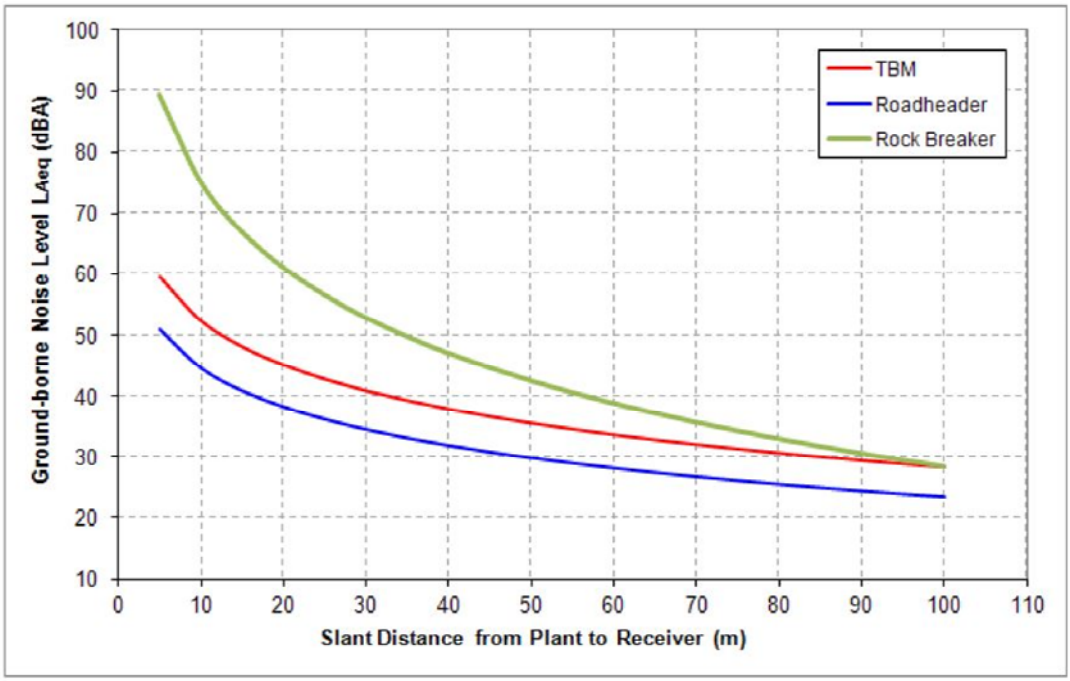
TBMs are not required for the CSM project, however roadheaders and rock breakers are a feature of the CSM project works and have therefore been assessed for potential ground-borne noise impacts.

As outlined in the EIS and the CNVS ground-borne noise levels are relevant only where they are higher than airborne noise levels. Therefore ground-

borne noise associated with other types of construction activities have not been further assessed as it is anticipated that the airborne construction noise levels of these activities will exceed any ground-borne regenerated noise levels.

Figure 4 provides indicative ground-borne noise levels for TBMs, roadheaders and rock breakers as presented in the EIS. Ground-borne noise levels will reduce as the distance between plant and the receptor increases.

Figure 2.1 ***Indicative Ground-borne Noise Levels - TBMs, Roadheaders and Rock Breakers (EIS, TfNSW 2016)***



3 EXISTING ENVIRONMENT

A key element in assessing environmental noise impacts is an understanding of the existing ambient and background noise levels in the vicinity of the closest and/or potentially most affected receptors situated in proximity to the site. The noise environment in the vicinity of the CSM project receptors is best described as 'urban' - defined by the NSW Environment Protection Authority (EPA) – Industrial Noise Policy (INP), (January 2000) as an area with an acoustical environment that:

- Is dominated by 'urban hum' or industrial source noise, where urban hum means the aggregate sound of many unidentifiable, mostly traffic and/or industrial related sound sources.
- Has through-traffic with characteristically heavy and continuous traffic flows during peak periods.
- Is near commercial districts or industrial districts.
- Has any combination of the above.

This area may be located in a residential zone as defined on an LEP or other planning instrument, and also includes mixed land use zones such as mixed commercial and residential uses.

3.1 POTENTIALLY SENSITIVE RECEPTORS

Fifty receptor locations have been identified to be the closest and/or potentially most affected locations situated within the potential area of influence of CSM works, as presented in **Table 3.1**.

These locations were established based on review of aerial photography, land use zoning and cadastre data and the results of preliminary noise modelling, where receptor positions were optimised to ensure representative worst-case levels were being predicted. These locations do not represent all receptors located in the vicinity of CSM works but have been selected for the purposes of this noise and vibration impact assessment; they are considered to be representative of locations that will potentially experience the highest impacts associated with CSM works, and will be the most affected during construction.

The residential receptors assessed in this CNVIS have been identified to occur within 'mixed use' and 'metropolitan centre' zoning areas. With reference to CoA – E41 and E42, it is understood that these receptors would therefore be considered "residential in a non-residential zone".

In addition to these locations the vibration assessment has considered potential impacts (cosmetic and structural damage) at the nearby heritage and rail structures throughout Central Station, situated around the site at various distances.

The sensitive receptor locations are identified in the **Figure 1.3** and detailed in **Table 3.1** below.

Table 3.1 Potentially Sensitive Receptors

Location ID	Receptor Type - Address	GPS Co-ordinates (UTM, Zone 56H)	
		Easting	Northing
R01	Commercial - 138 Hay St	334216.4	6249695
R02	Commercial - 323 Castlereagh St	334272.1	6249683
R03	Commercial - 467 Pitt St	334152.3	6249660
R04	Commercial - 228 Elizabeth St	334358.2	6249637
R05	Commercial - 477 Pitt St	334128.6	6249598
R06	Commercial - 24 Rawson Pl	334089.2	6249548
R07	Commercial - 242 Elizabeth St	334342.2	6249526
R08	YHA Hostel - 11 Rawson Pl	334043.1	6249500
R09	Church - 812 George St	334012.4	6249465
R10	Recreational - Belmore Park	334236.6	6249450
R11	Commercial (China Investment Corporation) - 250 Elizabeth St	334359.8	6249440
R12	Hostel (Wake up Sydney) - 509 Pitt St	333966.5	6249421
R13	Commercial (Various) - 280 Elizabeth St	334366.9	6249387
R14	Commercial (Various) - 300 Elizabeth St	334331.1	6249341
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	334313	6249294
R16	Adina Hotel - 2 Lee St	333939.5	6249286
R17	YHA Hostel - 10 Lee St	333981.5	6249254
R18	Dental Hospital_A (north) - 2 Chalmers St	334266.9	6249243
R19	Commercial - 18 Lee St	333891.6	6249237
R20	Commercial - 14 Lee St	333943.5	6249192
R21	Dental Hospital_B (south) - 2 Chalmers St	334234.7	6249191
R22	Residential - 1 Randle St	334258.3	6249181
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	334247.9	6249166
R24	Residential - 30 Chalmers St	334214.1	6249158
R25	Residential - 34 Regent St	333816.5	6249153
R26	Commercial (Various) - 11 Randle St	334236.4	6249146
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	333871.2	6249140
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	333915.9	6249140
R29	Residential - 38 Chalmers St	334206.7	6249133
R30	Commercial (Mils Gallery) - 15 Randle St	334231.7	6249128
R31	Residential - 46 Chalmers St	334203.5	6249112
R32	Commercial - 419 Elizabeth St	334236.4	6249102
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	334124	6249091
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	334213.1	6249082
R35	Residential - 53 Regent St	333789.1	6249079
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers St	334188.4	6249061
R37	Industrial (Substation) - Chalmers St	334091.3	6249045
R38	Residential - 65 Regent St	333771.3	6249030
R39	Residential - 73 Regent St	333748.4	6249003
R40	Industrial – Sydney Trains, Chalmers St	334001	6248958
R41	Residential - 52 Regent St	333736.8	6248899
R42	Residential - 105 Regent St	333691.4	6248897
R43	Residential - 54 Regent St	333729.8	6248879
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	333686	6248860
R45	Commercial – Sydney Trains, Chalmers St	333892.5	6248860
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	333680.4	6248828
R47	Commercial - 70 Regent St	333702.1	6248825
R48	Recreational - Prince Alfred Park	333855.6	6248776

Location ID	Receptor Type - Address	GPS Co-ordinates (UTM, Zone 56H)	
		Easting	Northing
R49	Church - 242 Cleveland St	333798.1	6248760
R50	Residential - 141 Regent St	333669.7	6248747

3.2 *BACKGROUND NOISE LEVELS*

Existing conditions have been quantified from the data presented in the EIS. Environmental noise monitoring was conducted by SLR at two locations during August to September 2015 to inform the EIS (TfNSW, SLR 2016). These monitoring locations are identified in the EIS as B.09 and B.10.

Supplementary data has been obtained from other reports provided by LOR, these are:

- Degnan Constructions Pty Ltd - Sydney to Burwood Compressor House Detailed Design Operational Noise Assessment, prepared by GHD Pty Ltd, dated November 2012 (GHD 2012).
- TfNSW – Power supply Upgrade Program – Lee Street Substation Noise and Vibration Assessment prepared by GHD Pty Ltd, dated February 2014 (GHD 2014).
- Sydney Yard Access Bridge – Noise Monitoring Summary Report, prepared by Environmental Resources Management (ERM) Pty Ltd, dated April 2018 (SYAB 2018).

The GHD 2012 report provides baseline noise data measured in Prince Alfred Park. The GHD 2014 report provides baseline noise data measured at 30 Lee Street, Haymarket NSW. The SYAB 2018 report provides baseline data measured at 54 Regent Street at the base of the Sydney Yard Access Bridge, in the rail corridor off Regent Street.

The RBLs presented in the EIS and each of the Supplementary reports are summarised in **Table 3.2** below. All unattended noise monitoring locations are presented in **Figure 1.3**.

Table 3.2 Background Monitoring Locations & RBLs

Location ID	Rating Background Noise Levels (RBL) in dBA		
	Daytime (7am - 6pm)	Evening (6pm - 10pm)	Night-time (10pm - 7am)
EIS B.09	56	53	45
EIS B.10	51	50	49
GHD 2012	48	48	45
GHD 2014	54	52	46
SYAB 2018	50	50	44

Source: EIS, GHD 2012, GHD 2012, SYAB 2018

The RBLs adopted for each receptor location are presented in **Table 3.3** below for the day, evening and night-time periods. These RBLs have been selected based on the nearest/most representative monitoring location outlined in **Table 3.2** and presented in **Figure 1.3**.

The INP and ICNG assessment periods are defined as follows:

- Daytime is the period from 7am to 6pm - Monday to Saturday; or 8am to 6pm on Sundays and Public Holidays;
- Evening is the period from 6pm to 10pm; and
- Night time is all remaining periods.

RBLs are utilised to establish project specific noise management levels (NMLs) for residential receptors, this is further outlined in **Chapter 4**. Non-residential NMLs are established from fixed values derived from the CNVS and ICNG, however the RBLs at non-residential receptors are provided in **Table 3.1** below for information purposes.

Due to the nature of site location and the identification of vibration sensitive equipment at receptors nearby. Vibration baseline monitoring will be undertaken at Dental Hospital and Central Station heritage structure (Electrical Building), prior to the commencement of construction works.

Due to the built environment of the area surrounding CSM works and the noise reduction expected from the shielding provided by the first row of buildings to the second row of buildings and receptors, reduced impacts are anticipated for these additional locations and in the broader community.

Table 3.3 Rating Background Noise Levels (RBL)

ID	Receptor Type - Address	RBL in dBA			RBL Source	Nearby Area of Works	Nearby Scenarios (SCN)
		Day	Evening	Night			
R01	Commercial - 138 Hay St	51	50	49	EIS B.10	Northern Concourse, Grand Concourse	SCN29 – SCN38
R02	Commercial - 323 Castlereagh St	51	50	49	EIS B.10	Northern Concourse, Grand Concourse	SCN29 – SCN38
R03	Commercial - 467 Pitt St	51	50	49	EIS B.10	Northern Concourse, Grand Concourse	SCN29 – SCN38
R04	Commercial - 228 Elizabeth St	51	50	49	EIS B.10	Northern Concourse, Grand Concourse	SCN29 – SCN38
R05	Commercial - 477 Pitt St	51	50	49	EIS B.10	Northern Concourse, Grand Concourse	SCN29 – SCN38
R06	Commercial - 24 Rawson Pl	51	50	49	EIS B.10	Northern Concourse, Grand Concourse	SCN29 – SCN38
R07	Commercial - 242 Elizabeth St	51	50	49	EIS B.10	Northern Concourse, Metro Box	SCN29 – 33, SCN09 –14
R08	YHA Hostel - 11 Rawson Pl	51	50	49	EIS B.10	Grand Concourse	SCN29 – SCN33
R09	Church - 812 George St	51	50	49	EIS B.10	Grand Concourse	SCN29 – SCN33
R10	Recreational - Belmore Park	51	50	49	EIS B.10	Northern Concourse, Metro Box	SCN09 –14, SCN34 -38
R11	Commercial (China Investment Corporation) - 250 Elizabeth St	56	53	45	EIS B.09	Northern Concourse, Metro Box	SCN09 –14, SCN34 -38
R12	Hostel (Wake up Sydney) - 509 Pitt St	51	50	49	EIS B.10	Grand Concourse	SCN29 – SCN33
R13	Commercial (Various) - 280 Elizabeth St	56	53	45	EIS B.09	Northern Concourse, Metro Box	SCN09 –14, SCN34 -38
R14	Commercial (Various) - 300 Elizabeth St	56	53	45	EIS B.09	Northern Concourse, Metro Box	SCN09 –14, SCN34 -38
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	56	53	45	EIS B.09	Northern Concourse, Metro Box, East Entrance	SCN09 –14, SCN34 -38, SCN23 -28
R16	Adina Hotel - 2 Lee St	51	50	49	EIS B.10	Grand Concourse, Metro Box, Platform Works	SCN29 –33, SCN09 -14, SCN01 –08
R17	YHA Hostel - 10 Lee St	54	52	49	GHD 2014, EIS B.10	Grand Concourse, Metro Box, Platform Works	SCN29 –33, SCN09 -14, SCN01 –08
R18	Dental Hospital_A (north) - 2 Chalmers St	56	53	45	EIS B.09	Metro Box, Central Walk/ESR, East Entrance	SCN09 - 14, SCN15 – 22, SCN23-28
R19	Commercial - 18 Lee St	51	50	49	EIS B.10	Grand Concourse, Metro Box, Platform Works	SCN29 – 33, SCN09 - 14, SCN01 – 08
R20	Commercial - 14 Lee St	54	52	49	GHD 2014, EIS B.10	Metro Box, Platform Works, Sydney Yard	SCN09 - 14, SCN01 – 08
R21	Dental Hospital_B (south) - 2 Chalmers St	56	53	45	EIS B.09	Metro Box, Central Walk/ESR, East Entrance	SCN09 - 14, SCN15 – 22, SCN23-28
R22	Residential - 1 Randle St	56	53	45	EIS B.09	Central Walk/ESR, East Entrance	SCN15 – 22, SCN23-28
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	56	53	45	EIS B.09	Central Walk/ESR, East Entrance	SCN15 – 22, SCN23-28
R24	Residential - 30 Chalmers St	56	53	45	EIS B.09	Central Walk/ESR, East Entrance	SCN15 – 22, SCN23-28
R25	Residential - 34 Regent St	54	52	46	GHD 2014	Sydney Yard	SCN01 – SCN08

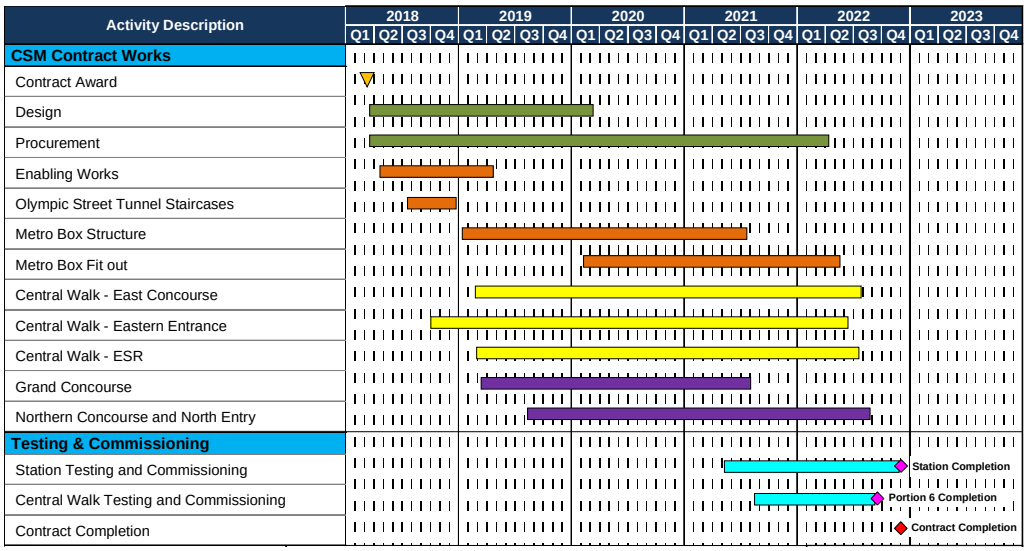
ID	Receptor Type - Address	RBL in dBA			RBL Source	Nearby Area of Works	Nearby Scenarios (SCN)
		Day	Evening	Night			
R26	Commercial (Various) - 11 Randle St	56	53	45	EIS B.09	Central Walk/ESR, East Entrance	SCN15 – 22, SCN23-28
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	54	52	46	GHD 2014	Sydney Yard	SCN01 – SCN08
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	54	52	46	GHD 2014	Metro Box, Sydney Yard	SCN09 – 14, SCN01 – 08
R29	Residential - 38 Chalmers St	56	53	45	EIS B.09	Central Walk/ESR, East Entrance	SCN15 – 22, SCN23-28
R30	Commercial (Mils Gallery) - 15 Randle St	56	53	45	EIS B.09	Central Walk/ESR, East Entrance	SCN15 – 22, SCN23-28
R31	Residential - 46 Chalmers St	56	53	45	EIS B.09	Central Walk/ESR, East Entrance	SCN15 – 22, SCN23-28
R32	Commercial - 419 Elizabeth St	56	53	45	EIS B.09	Central Walk/ESR, East Entrance	SCN15 – 22, SCN23-28
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	56	53	45	EIS B.09	Central Walk/ESR, East Entrance	SCN15 – 22, SCN23-28
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	56	53	45	EIS B.09	Central Walk/ESR, East Entrance	SCN15 – 22, SCN23-28
R35	Residential - 53 Regent St	54	52	46	GHD 2014	Sydney Yard	SCN01 – SCN08
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers St	56	53	45	EIS B.09	Central Walk/ESR, East Entrance	SCN15 – 22, SCN23-28
R37	Industrial (Substation) – Chalmers St	56	53	45	EIS B.09	Metro Box, Sydney Yard, Central Walk/ESR	SCN09 –14, SCN01 –08, SCN15 – 22
R38	Residential - 65 Regent St	54	52	46	GHD 2014	Sydney Yard	SCN01 – SCN08
R39	Residential - 73 Regent St	54	52	46	GHD 2014	Sydney Yard	SCN01 – SCN08
R40	Industrial – Sydney Trains, Chalmers St	48	48	45	GHD 2012	Metro Box, Sydney Yard	SCN09 – 14, SCN01 – 08
R41	Residential - 52 Regent St	50	50	44	SYAB 2018	SYAB, Sydney Yard	SCN39
R42	Residential - 105 Regent St	54	52	46	GHD 2014	SYAB, Sydney Yard	SCN39
R43	Residential - 54 Regent St	50	50	44	SYAB 2018	SYAB, Sydney Yard	SCN39
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	54	52	46	GHD 2014	SYAB, Sydney Yard	SCN39
R45	Commercial – Sydney Trains, Chalmers St	48	48	45	GHD 2012	SYAB, Sydney Yard	SCN39
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	54	52	46	GHD 2014	SYAB, Sydney Yard	SCN39
R47	Commercial - 70 Regent St	54	52	46	GHD 2014	SYAB, Sydney Yard	SCN39
R48	Recreational - Prince Alfred Park	48	48	45	GHD 2012	SYAB, Sydney Yard	SCN39
R49	Church - 242 Cleveland St	48	48	45	GHD 2012	SYAB, Sydney Yard	SCN39
R50	Residential - 141 Regent St	54	52	46	GHD 2014	SYAB, Sydney Yard	SCN39

3.3 *ASSESSMENT SCENARIOS*

Assessment scenarios were developed to identify significant noise and vibration generating plant, equipment and machinery that may be in use or activities that will be undertaken as part of the CSM works. These scenarios were informed through information provided by LOR and the indicative construction schedule provided in the CEMP.

A summary of the indicative construction schedule that was considered is provided below in **Figure 3.1.** The full set of data and assessment scenarios that were considered is provided in **Annex B.**

Figure 3.1 Indicative Construction Schedule



The sound power level (LW) data identified in **Annex B** for individual plant and equipment is presented as relevant to the noise assessment, as well as the quantity of equipment and potential for out-of-hours works (OOHW) to be required.

For ground-borne vibration and ground-borne noise, only the activities and/or equipment with potential to generate ground-borne vibration or ground-borne noise (e.g. demolition, rock breaking, vibratory compaction and sheet piling) were considered as is described in **Chapter 7** of this document.

A number of general modelling features are also described in **Annex B**. **Quantity** is the number of equipment operating per 15 minute assessment period. **Duty Factor** is the percentage of time the equipment operates per 15 minute assessment period, or represents a reduced emission for part of the period. **Base LW Value** is source emission or 'Sound Power Level' (LW) directly allocated to the equipment, unadjusted. **Penalty** (modifying correction factor) considers any annoying characteristics such as tonality, low frequency noise or impulsiveness. **Total LW Value** is the overall equipment source emission (LW) adjusted for the quality, duty factor and penalty.

4 MANAGEMENT LEVELS AND CRITERIA

This chapter outlines the noise and vibration management levels and criteria as relevant to the CSM project.

Consultation for the CNVIS will be conducted in stages, as it is anticipated there will be ongoing changes of occupants at each receptor location over the construction period. Consultation will occur at least four weeks prior to the commencement of a scenario of work (as defined in the CNVIS). The receptor types identified in **Chapter 3** and **4** are based on the information held by the LOR community consultation team on the date of issue of this CNVIS. These receptor types and the appropriate NML values be updated and the CNVIS reissued to the AA and ER at least four weeks prior to commencement of a particular scenario as the project progresses and consultation continues over the life of the project.

4.1 AIR-BORNE NOISE MANAGEMENT LEVELS

Based on the ICNG and CNVS methodology the following construction Noise Management Levels (NMLs) for residential receptors will apply to the CSM project as presented in **Table 4.1.**

A conservative approach has been adopted whereby the residential NMLs have also been adopted for other sensitive receptor that may provide a temporary dwelling, i.e. hotels and hostels. Predicted noise levels are compared to these "criteria" values in **Section 5** to identify any activities that exceed the applicable management levels and to identify the extent of potential noise impacts.

For other sensitive receptors (i.e. not residential or dwelling) the internal/external criteria value translated from the ICNG may be adopted as relevant and if other receptors are identified. External NMLs for other sensitive receptors applicable to this assessment have also been included in **Table 4.2** below. These NML values apply to other sensitive receptors when in-use.

The ICNG assessment periods as relevant to the CSM project are defined as follows:

- Standard (daytime): 7:00am to 6:00pm Mondays to Fridays, inclusive and 8:00am to 1:00pm Saturdays.
- Outside standard (daytime): 1:00pm to 6:00pm Saturdays, and 8:00am to 6:00pm on Sundays or public holidays.
- Outside standard (evening): 6:00pm to 10pm Monday to Sunday, inclusive.
- Outside standard (night time): 10:00pm to 7:00am Monday to Friday and 10:00pm to 8:00am on Saturdays, Sundays and public holidays

It should be noted that the hours of business for the Dental Hospital (R18 / R21), are 8:00AM to 4:30PM Monday to Friday. Therefore this assessment does not consider impacts for the Dental Hospital to occur outside the standard hours of construction.

4.1.1 Highly Noise Affected Management Level

In accordance with the ICNG and CNVS, the Highly Noise Affected Management Level (HNML) of 75 dBA will apply to residential (dwelling) receptors.

4.1.2 Sleep Disturbance

'Sleep disturbance screening thresholds' have been developed as per the guidance in the INP and CNVS (RBL + 15dBA). These screening levels (refer **Table 4.1**) will only apply during the night time period.

In addition to the current legislative guidance on potential sleep disturbance outlined in the CNVS, the RNP refers to the Road and Traffic Authority's (RTA's) 'Environmental Noise Management Manual' (ENMM) for specific impacts from road traffic. The ENMM recommends an evaluation of the number and distribution of night-time pass by events where the L_{AFmax} – $L_{Aeq, 1hour}$ difference is greater than 15 dB, and the maximum noise level of that event is greater than 65 dB L_{Amax}.

On the basis of the current guidance:

- External sleep disturbance screening criterion of RBL + 15 dB.
- External sleep disturbance criterion (sleep awakening level) of 65 dB L_{Amax} (assuming open windows).

These screening levels will generally apply at residential (dwelling) receptors with other sensitive receptors considered where applicable e.g. at other receptors where habitable sleeping spaces are identified. These sleep disturbance screening levels only apply during the night time defined by the INP as the period from 10:00pm to 07:00am (Monday to Saturday) and 10:00pm to 08:00am (Sundays and Public Holidays).

It should also be noted that the Sydney Metro OOHW Protocol has a process to identify sleep disturbance impacts. Where the predicted noise level of the OOHW has a likelihood for potential sleep disturbance (i.e. RBL + 15 dB or more) the OOHW is identified as 'high risk' and specific mitigation measures apply. These mitigation measures are also considered in this CNVIS and are referred to as additional mitigation measures this is further detailed in **Section 4.5**.

Table 4.1 Noise Management Levels (Airborne Noise)

ID	Receptor Type - Address	Noise Management Levels - $L_{eq,\ 15\ minute}$ in dBA				Sleep Disturbance ($L_{A1,1minute}$ / L_{Amax})	Sleep Awakening Level (L_{Amax})
		Standard Construction Hours	Outside Standard Construction Hours				
			Daytime	Evening	Night		
R01	Commercial - 138 Hay St	70	70	70	70	-	-
R02	Commercial - 323 Castlereagh St	70	70	70	70	-	-
R03	Commercial - 467 Pitt St	70	70	70	70	-	-
R04	Commercial - 228 Elizabeth St	70	70	70	70	-	-
R05	Commercial - 477 Pitt St	70	70	70	70	-	-
R06	Commercial - 24 Rawson Pl	70	70	70	70	-	-
R07	Commercial - 242 Elizabeth St	70	70	70	70	-	-
R08	YHA Hostel - 11 Rawson Pl	61	56	55	54	64	65
R09	Church - 812 George St	55	55	55	55	-	-
R10	Recreational - Belmore Park	60	60	60	60	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth St	70	70	70	70	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	61	56	55	54	64	65
R13	Commercial (Various) - 280 Elizabeth St	70	70	70	70	-	-
R14	Commercial (Various) - 300 Elizabeth St	70	70	70	70	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	70	70	70	70	-	-
R16	Adina Hotel - 2 Lee St	61	56	55	54	64	65
R17	YHA Hostel - 10 Lee St	64	59	57	54	64	65
R18	Dental Hospital_A (north) - 2 Chalmers St	55	55	55	55	-	-
R19	Commercial - 18 Lee St	70	70	70	70	-	-
R20	Commercial - 14 Lee St	70	70	70	70	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	55	55	55	55	-	-
R22	Residential - 1 Randle St	66	61	58	50	60	65
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	60	60	60	60	-	-

R24	Residential - 30 Chalmers St	66	61	58	50	60	65
R25	Residential - 34 Regent St	64	59	57	51	61	65
R26	Commercial (Various) - 11 Randle St	70	70	70	70	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	70	70	70	70	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	70	70	70	70	-	-
R29	Residential - 38 Chalmers St	66	61	58	50	60	65
R30	Commercial (Mils Gallery) - 15 Randle St	70	70	70	70	-	-
R31	Residential - 46 Chalmers St	66	61	58	50	60	65
R32	Commercial - 419 Elizabeth St	70	70	70	70	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	70	70	70	70	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	60	60	60	60	-	-
R35	Residential - 53 Regent St	64	59	57	51	61	65
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers St	60	60	60	60	-	-
R37	Industrial (Substation) – Chalmers St	75	75	75	75	-	-
R38	Residential - 65 Regent St	64	59	57	51	61	65
R39	Residential - 73 Regent St	64	59	57	51	61	65
R40	Industrial – Sydney Trains, Chalmers St	75	75	75	75	-	-
R41	Residential - 52 Regent St	60	55	55	49	59	65
R42	Residential - 105 Regent St	64	59	57	51	61	65
R43	Residential - 54 Regent St	60	55	55	49	59	65
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	70	70	70	70	-	-
R45	Commercial – Sydney Trains, Chalmers St	70	70	70	70	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	60	60	60	60	-	-
R47	Commercial - 70 Regent St	70	70	70	70	-	-
R48	Recreational - Prince Alfred Park	65	65	65	65	-	-
R49	Church - 242 Cleveland St	55	55	55	55	-	-
R50	Residential - 141 Regent St	64	59	57	51	61	65

RBL Data Source: EIS – TfNSW/SLR 2016, GHD 2012, GHD 2014, SYAB 2018; Commercial NML Source: CNVS, ICNG

4.1.3 Internal Noise Criteria

In addition to the NMLs outlined in **Table 4.1** (above). The CSM project conditions of approval also stipulate internal noise level limits relevant to internal noise levels (air-borne and ground-borne), these conditions include CoA – E37, E38, E41, E42 and E43. **Table 4.2** below provides a summary of the internal noise criteria applicable under the Conditions of Approval for the CSM project.

In accordance with CoA – E37, LOR must identify all receivers likely to experience internal noise levels greater than $L_{eq,\ 15\ minute}$ 60 dBA inclusive of a 5 dB penalty, if rock breaking or any other annoying activity likely to result in regenerated (ground-borne) noise or a perceptible level of vibration is planned (including works associated with utility adjustments), between 7am – 8pm.

As the potentially sensitive residential receptors identified for the CSM project have been identified to occur outside a residential zone (i.e mixed use and metropolitan centre), CoA – E41 takes precedence over CoA – E42. Therefore, the proponent must ensure that residential receptors, located in non-residential zones, likely to experience an internal noise level exceeding $L_{eq,15\ minute}$ 60 dBA between 8pm and 9pm or $L_{eq,\ 15\ minute}$ 45 dBA between 9pm and 7am (inclusive of a 5 dB penalty if rock breaking or any other annoying activity likely to result in ground-borne noise, or a perceptible level of vibration is planned (including works associated with utility adjustments)) must be offered additional mitigation in accordance with the Sydney Metro City and South West Noise and Vibration Strategy referenced in CoA - E32.

Table 4.2 Internal Noise Criteria

Area	Receptor Type	Condition of Approval (CoA)	Time Period	Criteria
Identified Precincts (Central)	All	E37/E38	7am to 8pm	Leq, 15 minute 60 dBA internal, more than 50% of time (6.5 hours total)
				Leq, 15 minute 55 dBA internal, more than 25% of time (3.25 hours total)
Non-residential zones	Residential	E41	8pm to 9pm	Leq, 15 minute 60 dBA internal
		E41	9pm to 7am	Leq, 15minute 45 dBA internal
Residential Zones	Residential	E42	8pm to 7am	Leq, 15minute 45 dBA internal
All	All	E43	all	Leq, 8 hour 85 dBA near the CSSI

Source: CNVS, CoA

4.2 ROAD TRAFFIC NOISE MANAGEMENT LEVELS

The ICNG does not include any criteria to assess off-site traffic noise associated with construction and demolition. Criteria for off-site road traffic noise applicable to 'existing residences affected by additional traffic on existing roads generated by land use developments' are specified in the RNP.

An objective of the RNP is to protect sensitive receptors against excessive decreases in amenity as the result of a project by applying apply relevant permissible noise increase criteria. In assessing feasible and reasonable mitigation measures, an increase of up to 2 dBA represents a minor impact that is considered barely perceptible to the average person.

On this basis, as outlined in the CNVS, construction traffic NMLs set at 2 dBA above the existing road traffic noise levels during the daytime and night-time periods are considered appropriate to identify the onset of potential noise impacts. Where the road traffic noise levels are predicted to increase by more than 2 dBA as a result of construction traffic, consideration would be given to applying feasible and reasonable noise mitigation measures to reduce the potential noise impacts and preserve acoustic amenity.

In considering feasible and reasonable mitigation measures where the relevant noise increase is greater than 2 dB, consideration would also be given to the actual noise levels associated with construction traffic and whether or not these levels comply with the road traffic noise criteria in the RNP, refer **Table 4.2**.

Table 4.3 Road Traffic Noise Management Levels

Category	Applicable Road	Management Level, dBA	
		Daytime[1]	Night time[2]
Sub-arterial roads	e.g. Regent Street / Chalmers Street	Leq,15 hour ≤ 60 (external)	Leq,9 hour ≤ 55 (external)
Local roads	e.g. Randle Street	Leq,1 hour ≤ 55 (external)	Leq,1 hour ≤ 50 (external)

Source: CNVS, RNP

1. Daytime means between 7:00am and 10:00pm, Monday to Sunday inclusive; and
2. Night time means between 10:00pm to 7:00am, Monday to Sunday inclusive.

4.3 GROUND-BORNE NOISE MANAGEMENT LEVELS

Ground-borne noise is noise generated by vibration transmitted through the ground into a structure. The following ground-borne noise levels for residences are nominated in the ICNG and CNVS and indicate when management actions would be implemented. These levels recognise the temporary nature of construction and are only applicable when ground-borne noise levels are higher than air-borne noise levels. Ground-borne noise management levels are summarised in **Table 4.4** below.

As outlined above in **Section 4.1.3,** CoA also stipulate internal noise level limits relevant to internal noise levels (including ground-borne noise). These internal noise levels are summarised in **Table 4.2**.

Table 4.4 Ground-Borne Noise Management Levels

Receptor Type	Management Level, $L_{eq,\ 15\ minute}$ dBA		
	Daytime[1]	Evening[2]	Night time[3]
Commercial (internal)	50	-	-
Residential (internal)	45	40	35

Source: CNVS

1. Daytime means between 7:00am and 6:00pm, Monday to Sunday inclusive;
2. Evening means between 6:00pm and 10:00pm, Monday to Sunday inclusive; and
3. Night time means between 10:00pm to 7:00am, Monday to Sunday inclusive.

4.4 GROUND-BORNE VIBRATION MANAGEMENT LEVELS

Based on the CNVS methodology, impacts from vibration will be considered in terms of effects on building occupants (human comfort), the effects on the building structure (structural/cosmetic damage) and the effects on sensitive medical/scientific equipment. The following construction vibration management levels / criteria will apply to the CSM project as presented below.

Human Comfort

The NSW Vibration Guideline and the CNVS provides guidance for assessing human exposure to vibration. These documents are based on *British Standard (BS 6472–1992) – Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz) dated 1992*. The vibration dose values recommended in BS 6472-1992 for which various levels of adverse comment from occupants may be expected are presented in **Table 4.4**.

Table 4.5 Vibration Management Levels: Human Comfort – Vibration Dose Values

Place and Time	Low Probability of Adverse Comment ($m/s^{1.75}$)	Adverse Comment Possible ($m/s^{1.75}$)	Adverse Comment Probable ($m/s^{1.75}$)
Residential buildings 16 hr day	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings 8 hr night	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

Source: CNVS

1. For offices and workshops, multiplying factors of 2 and 4 respectively would be applied to the above vibration dose value ranges for a 16 hr day.

Building Damage (Structural/Cosmetic Damage)

To achieve the requirements of the CNVS, *British Standard BS7385: Part 2-1993 (BS 7385) - Evaluation and Measurement for Vibration in Buildings – Part 2 – Guide to Damage Levels from Ground-borne Vibration, dated 1993* is presented in **Table 4.5** and will be considered during works where applicable. BS 7385 provides safe limit guideline values, below which vibration is considered insufficient to cause structural or cosmetic damage to buildings.

Table 4.6 Vibration Management Levels: Building Damage (BS 7385)

Line	Type of Building	Peak Particle Velocity (PPV in mm/s) in the Frequency Range of Predominant Pulse	
		4 Hz to 15 Hz	15 Hz and Above
1	Reinforced or framed structures Industrial and heavy commercial buildings	50mm/s at 4 Hz and above	
2	Unreinforced or light framed structures. Residential or light commercial type buildings	15mm/s at 4 Hz increasing to 20mm/s at 15 Hz	20mm/s at 15 Hz increasing to 50mm/s at 40 Hz and above

Source: BS 7385, *CNVS*

For most construction activities involving intermittent vibration sources such as rock breakers, piling rigs, vibratory rollers and the like, the predominant vibration energy occurs at frequencies greater than 4 Hz (usually in the 10 Hz to 100 Hz range). On this basis, a conservative vibration damage screening level per receptor type is given below:

- Reinforced or framed structures: **25.0 mm/s**
- Unreinforced or light framed structures: **7.5 mm/s**

At locations where the predicted and/or measured vibration levels are greater than shown above (peak component particle velocity), a more detailed analysis of the building structure, vibration source, dominant frequencies and dynamic characteristics of the structure would be required to determine the applicable safe vibration level.

Heritage Structures: in accordance with the CNVS, if a heritage building or structure is found to be structurally unsound (following inspection) a more conservative cosmetic damage criteria of **2.5 mm/s** peak component particle velocity from the German Institute for Standardisation – DIN 4150 (1999-02) Part 3 (DIN4150:3) – Structural Vibration - Effects of Vibration on Structures, dated 1999 would be considered.

No buildings were identified in proximity to the CSM project as structurally unsound in the tender documents. During the preparation of this report heritage buildings within close proximity to the CSM project were being assessed by a structural engineer as part of the pre-construction surveys. In the unlikely event that a building is deemed structurally unsound during

these surveys then the DIN4150 heritage criteria will be applied. However at this stage it is considered that the heritage buildings in close proximity to the CSM works are structurally sound. The DIN4150:3 criteria are therefore not assessed for any buildings identified in this report.

Sensitive Scientific and Medical Equipment

Some scientific equipment (e.g. electron microscopes and microelectronics manufacturing equipment) can require more stringent objectives than those applicable to human comfort.

Where it has been identified that vibration sensitive scientific and/or medical instruments are likely to be in use inside the premises of an identified vibration sensitive receptor, objectives for the satisfactory operation of the instrument would be sourced from manufacturer's data. Where manufacturer's data is not available, generic vibration criterion (VC) curves as detailed in the CNVS and presented below in **Table 4.6** would be adopted as vibration goals.

It should be noted that these criterion are very conservative, therefore baseline vibration measurements may be undertaken at receptors that are identified to contain sensitive scientific / medical equipment prior to construction activities being undertaken. The baseline data in combination with the VC curves presented below would ascertain project / equipment specific vibration criteria.

Table 4.7 Application and Interpretation of the Generic Vibration Criterion (VC) Curves

Criterion Curve	Max Level (µm/sec, rms)1	Detail Size (microns)2	Description of Use
VC-A	50	8	Adequate in most instances for optical microscopes to 400X, microbalances, optical balances, proximity and projection aligners, etc.
VC-B	25	3	An appropriate standard for optical microscopes to 1000X, inspection and lithography equipment (including steppers) to 3 micron line widths.
VC-C	12.5	1	A good standard for most lithography and inspection equipment to 1 micron detail size.
VC-D	6	0.3	Suitable in most instances for the most demanding equipment including electron microscopes and E-Beam systems, operating to the limits of their capability.
VC-E	3	0.1	A difficult criterion to achieve in most instances. Assumed to be adequate for the most demanding of sensitive systems including long path, laser-based, small target systems and other systems requiring extraordinary dynamic stability.

Source: CNVS

1. *As measured in one-third octave bands of frequency over the frequency range 8 to 100 Hz.*
2. *The detail size refers to the line widths for microelectronics fabrication, the particle (cell) size for medical and pharmaceutical research, etc. The values given take into account the observation requirements of many items depend upon the detail size of the process.*

4.5 THRESHOLDS FOR ADDITIONAL MITIGATION MEASURES

The project-specific mitigation measures are a feature to be outlined in the CNVMP and are defined based on the activities proposed and potential impacts. "Standard" mitigation (and practices) applicable to the CSM works are described in Section 7 of the CNVS and the actions set out must be implemented on all Sydney Metro construction projects.

Where the predicted "mitigated" construction noise levels are above the ICNG noise management levels, the Additional Mitigation Measures Matrix (AMMM) identified in Section 8 of the CNVS is to be implemented. The approach, guided by the AMMM, is primarily aimed at pro-active engagement with affected sensitive receptors rather than additional noise reducing mitigation. The AMMM applies to all receptor types where these receptors are in-use.

The types of additional mitigation measures are listed in **Table 4.7** and described in the CNVS.

Table 4.8 Additional Mitigation Measures

Measure	Abbreviation
Alternative accommodation	AA
Monitoring	M
Individual briefings	IB
Letter box drops	LB
Project specific respite offer	RO
Phone calls	PC
Specific notifications	SN

Source: CNVS

The project-specific AMMM for construction (air-borne) noise are identified in **Table 4.9**. Any air-borne noise level exceedances of the AMMM thresholds are highlighted in red, blue, olive green or purple (as shown in **Annex C**) as is applicable to the findings of this assessment. The project-specific AMMM for ground-borne noise and ground-borne vibration are identified in **Table 4.9** and **Table 4.10**.

Table 4.9 Additional Mitigation Measures Matrix (AMMM) – Construction Air-borne Noise

Period	Time of Day	Mitigation Measures Predicted $L_{Aeq, 15minute}$ Noise Level Above RBL			
		0 to 10 dBA	10 to 20 dBA	20 to 30 dBA	>30 dBA
Standard	Mon-Fri (7am - 6pm)	-	-	M, LB	M, LB
	Saturdays (8am - 1pm)				
	Sundays/Public Holidays (No Works)				
OOHW Period 1	Mon-Fri (6pm - 10pm)	-	LB	M, LB	M, IB, LB, PC, RO, SN
	Saturdays (7am-8am) and (1pm- 10pm)				
	Sundays/Public Holidays (8am-6pm)				
OOHW Period 2	Mon-Fri (10pm - 7am)	-	M, LB	M, IB, LB, PC, RO, SN	AA, M, IB, LB, PC, RO, SN
	Saturdays (10pm - 8am)				
	Sundays/Public Holidays (6pm - 7am)				

1. Source: CNVS

Table 4.10 Additional Mitigation Measures Matrix (AMMM) – Construction Ground-borne Noise

Period	Time of Day	Mitigation Measures Predicted $L_{Aeq,\ 15minute}$ Noise Level Exceedance of NML		
		0 to 10 dBA	10 to 20 dBA	20 to 30 dBA
Standard	Mon-Fri (7am - 6pm)	LB	LB	M, LB, SN
	Saturdays (8am - 1pm)			
	Sundays/Public Holidays (No Works)			
OOHW Period 1	Mon-Fri (6pm - 10pm)	LB	M, LB, SN	M, IB, LB, PC, RO, SN
	Saturdays (7am-8am) and (1pm- 10pm)			
	Sundays/Public Holidays (8am-6pm)			
OOHW Period 2	Mon-Fri (10pm - 7am)	M, LB, SN,	AA, M, IB, LB, PC, RO, SN	AA, M, IB, LB, PC, RO, SN
	Saturdays (10pm - 8am)			
	Sundays/Public Holidays (6pm - 7am)			

1. Source: CNVS

Table 4.11 Additional Mitigation Measures Matrix (AMMM) – Construction Ground-borne Vibration

Time Period		Mitigation Measures Predicted Vibration Levels Exceed Human Comfort Criteria (BS 6472:1992)
Standard	Mon-Fri (7am-6pm)	M, LB, RO
	Sat (8am-1pm)	
	Sun/Pub Hol (Nil)	
OOHW Period 1	Mon-Fri (6pm-10pm)	M, IB, LB, PC, RO, SN
	Sat (7am-8am and 1pm-10pm)	
	Sun/Pub Hol (8am-6pm)	
OOHW Period 2	Mon-Fri (10pm-7am)	AA, M, IB, LB, PC, RO, SN
	Sat (10pm-8am)	
	Sun/Pub Hol (6pm-7am)	

1. Source: CNVS

5 AIR-BORNE NOISE IMPACT ASSESSMENT

This chapter outlines the air-borne noise impact assessment results and findings as relevant to the CSM project.

5.1 GENERAL CONSTRUCTION NOISE

Air-borne noise levels have been predicted via 3D noise modelling for a range of works and activities associated with the projects construction as outlined in **Section 2.3**. These predicted noise levels are detailed in **Annex C** and address each work area/activity so that any additional mitigation and management measures (to those already incorporated into the construction design and noise modelling) may be defined for each representative worst-case assessment scenario.

This method is typical of NSW construction projects especially those of the scale of CSM where there is a large spatial area (approximately 8.5 hectares) and temporal boundary (approximately five year construction program). In these cases there is limited potential for significantly increased noise levels and associated impacts to occur due to concurrent works.

This is primarily due to the dominant influence of the works conducted at or near the most affected receptor (on which the CNVIS and CNVMP is based), which will mask the influence of other works occurring at the time. The construction schedule / timing of works is also an influence when considering this potential as in many cases there are different activities that will be undertaken at the same location over the course of the construction schedule i.e. they will not occur concurrently.

The conservative nature of the predictive inputs that consider all plant, equipment and/or machinery operating concurrently for each scenario are also an influence when considering this feature. The predicted values do not represent a constant noise emission that would be experienced by the community on a daily basis throughout the project's construction schedule, they will only be experienced for limited periods of time when those specific activities are occurring, and they will not be experienced over the whole daytime, evening or night time period.

When evaluating potential effects of concurrent work it is also important to consider how noise levels add together. For example, if two separate activities are occurring and the noise level from each is 55 dBA at the receptor, then the resultant noise level is 58 dBA. This increase in noise level (3 dBA) will be just perceptible and a significant change in impact unlikely. If two separate activities are occurring and the noise level from one is 55 dBA and the other is 53 dBA, then the resultant noise level is 57 dBA. This increase in noise level (2 dBA) will be hardly perceptible in practice and a significant change in impact is highly unlikely.

Based on this information the CNVMP provides a set of provisions, safeguards and monitoring contingencies are provided in the unlikely event that additional issues associated with concurrent works are identified and further mitigation is required. These provisions, safeguards and contingencies are outlined in Section 10.2.3 of the CNVMP.

Based on the methodology, inputs and assumptions described above in **Chapter 2**, $L_{Aeq,\ 15minute}$ noise levels have been predicted. All noise levels have been rounded to the nearest whole integer.

Due to the large number of assessment scenarios and corresponding results, the resultant noise levels and comparison to the NMLs are presented in **Annex C**.

Values that exceed the HNML (fixed at 75 dBA for residential receptors) are highlighted in **bold and underlined** typeset. Where the NML is exceeded a comparison to the RBL is presented and colour coded to align with the AMMM outlined in **Section 4.5**.

5.1.1 Discussion Of Results

The resultant noise levels are summarised below:

- The highest predicted ($L_{eq,\ 15\ minute}$ in dBA) noise levels range between 82 and 98 dBA associated with the demolition of the Bounce Hotel occurring in SCN23. Other scenarios with the similarly elevated predicted noise levels at receptors are associated with construction of the East Entrance (i.e. SCN24 to SCN28) where works are being undertaken in close proximity to potentially sensitive receptors. These noise levels are predicted at the nearest receptors generally located in the first row of buildings with direct line of sight to CSM works.

- The daytime NML applicable at residential (or occupied dwelling) receptors for works within the recommended standard hours for construction is exceeded by up to 24 dBA at the most affected locations in SCN23.

- For other key scenarios, e.g. SCN24 to SCN28 the daytime NML applicable at residential (occupied dwellings) receptors for works within the recommended standard hours for construction is exceeded by between 12 and 21 dBA at the most affected locations.

- The daytime NML applicable at commercial and other sensitive receptors for works within the recommended standard hours for construction is exceeded by up to 34 dBA at the most affected locations in SCN23.

- The extent that noise levels are predicted to exceed the NML at residential receptors, for works outside the recommended hours for construction, varies depending on the assessment scenario and period i.e. daytime, evening and night time. Predicted noise levels exceed the NML to a larger extent during the evening and night time (when compared to the daytime)

as the NML are more stringent during those periods. Therefore where OOHW are assessed the highest exceedances are predicted for the night time, when the most stringent NML apply.

- For commercial and other sensitive receptors (i.e. not residential or dwelling) the extent that noise levels are predicted to exceed the NML varies depending on the assessment scenario however is the same for each period, as the NML are fixed values for all times of the day and days of the week.

- It is noted that the HNML (75 dBA) applicable at residential (dwelling) receptors during the daytime is exceeded for at least one receptor in the first row of buildings in the following scenarios: SCN02, SCN17, SCN23 to SCN28, SCN30, SCN32, SCN35, SCN37 and SCN38.

- It is possible to estimate internal noise levels based on the predicted values presented above for each scenario by deducting 10 dBA from these external values to represent windows being partially open and by deducting 20 dBA to represent windows being closed. Comparing the estimated internal noise levels to the **CoA – E37/E38** and **E41** requirements (i.e. respite/additional mitigation must be offered to residents that experience internal noise levels of $L_{Aeq,\,15\ minute}$, 60 dBA, $L_{Aeq,\,15\ minute}$, 55 dBA or $L_{Aeq,\,15\ minute}$, 45 dBA) identifies that noise levels will generally be in compliance for the broader community but levels are likely to exceed the **CoA – E37/E38** and **E41** threshold at the first row of buildings around the works. This trend is likely to occur during a number of scenarios.

- Scenarios SCN23 to SCN28 are predicted to generate noise levels >30dBA (above RBL as per the AMMM) at the closest and most affected receptors for works within the recommended standard hours of construction.

- Scenarios SCN02 and SCN17are predicted to generate noise levels >30dBA (above the RBL as per the AMMM) at the closest and most affected receptors for works outside the recommended standard hours of construction.

- Predicted noise levels exceed the existing background noise level to a larger extent during the evening and night time period (when compared to the daytime) as the existing background noise levels are lower during those periods.

- For works within the recommended standard hours for construction, letterbox drops and noise monitoring will be required at the most affected locations during select construction activities associated with CSM works.

- For works outside the recommended standard hours for construction, a combination of the following mitigation will be triggered from the AMMM: alternative accommodation, monitoring, individual briefings, letter box drops, project specific respite offer, phone calls and specific

notifications. These measures will be required at the most affected locations during select construction activities associated with CSM works.

5.1.2 Summary Of Findings

The predicted noise levels summarised above and presented in **Annex C** are typical of construction works and activities undertaken in the vicinity of residential and commercial land use precincts. These predicted values do not represent a constant noise emission that would be experienced by the community on a daily basis throughout the project's construction schedule. The predicted noise levels will only be experienced for limited periods of time when works are occurring; they will not be experienced over whole daytime, evening or night time periods. Construction noise emissions will be temporary and do not represent a permanent impact on the community and surrounding environment.

Some noise from construction sites is inevitable, such that the ICNG focuses on minimising construction noise impacts, rather than only on achieving numeric noise levels. These results and noted exceedances identify that best-practice construction noise management and control techniques will be required to reduce noise levels as far as practicable. To minimise impacts additional noise control, mitigation and management measures may also be warranted, refer **Chapter 8**. These will need to be implemented in conjunction with community and stakeholder consultation and notification processes outlined in the AMMM in **Section 4.5**.

5.1.3 Additional Mitigation And Exceedances

Where the predicted construction noise levels are above the NML, the AMMM identified in Section 8 of the CNVS and **Section 4.5** of this CNVIS should be implemented. Predicted values at select receptors exceed the project-specific NML. The level by which they exceed the NML varies depending on the assessment scenario, the receptor proximity to the activity and the time of day.

A comparison of the predicted construction noise levels to the existing background noise levels ($L_{A90, period}$) is therefore required (for any receptor where the NML is exceeded) to establish the necessary mitigation AMMM requirements. This comparison is provided in **Annex C**.

Any noise level exceedance of the AMMM thresholds (refer **Table 4.8**) is highlighted in red, blue, olive green or purple to illustrate the extent and level of AMMM required.

The AMMM is only applicable to commercial or other sensitive receptors (i.e. offices / places of worship) when these receptors are in use it should be noted that these receptors may not be in use during the night time period.

Guidance Note

During construction works, actual noise levels will vary depending on the number of items of equipment, their exact location within the site, their usage and how many items of equipment operate concurrently at any one time. A receptor will therefore experience a range of noise levels. Construction noise level predictions have been conducted to identify results for representative worst-case scenarios, as the predicted values consider the cumulative emission (and potential impact) of all equipment sources working concurrently.

It is not possible, or warranted to reflect potential impacts, to model every plausible activity, task or usage for each noise generating source and location, hence the conservative approach adopted here has been applied to ensure that representative worst-case noise predictions were conducted.

Furthermore, area sources were utilised to reflect the potential distribution of noise across the project area, and the potential emissions from activities undertaken at various locations within and around the site.

This assessment has considered standard good practice mitigation measures via noise modelling by adopting the midpoint values for all sound power levels. However it should also be noted that the predicted noise levels presented below have not considered the recommended project specific mitigation and management measures outlined in **Chapter 8** of this CNVIS. With the implementation of the recommended mitigation and management measures outlined in **Chapter 8** a reduction in the predicted noise levels would be expected.

5.1.4 Working Outside Standard Hours

Based on the noise levels predicted to exceed criteria identified in **Annex C** it is also considered that the sleep disturbance screening criteria will be exceeded at the nearest and most sensitive residential receptors (or hotel/hostels) during OOHW.

With due regard to the AMMM, the extent of additional mitigation required will increase for out-of-hours work (refer **Annex C**) compared to that assessed for works within the standard hours. More mitigation is necessary in accordance with the CNVS for works undertaken outside the recommended standard hours for construction. This feature is a well-accepted element of good industry practice construction noise management; high noise generating activities should be avoided in the evening, at night and on the weekends as receptors are generally more sensitive during those periods. If high impact works must be carried out at night, it is preferable to conduct high impact activities prior to midnight than after midnight. This should be considered and implemented wherever possible for night time works near residential receivers.

In accordance with the requirements of the ICNG and the CNVS suitable recommendations, which can be practically implemented on site, should be provided in the CNVMP. Construction noise levels will be reduced and impacts minimised with the successful implementation of these

recommendations. Impacts may not be reduced to negligible levels for all receptors during all construction activities; however the recommendations are designed to ensure that any residual impacts are minimised as far as is practically achievable.

5.2 CONSTRUCTION ROAD TRAFFIC (SYDNEY YARD ACCESS BRIDGE)

Construction road traffic noise generated by heavy vehicles on the Sydney Yard Access Bridge (SYAB) has been assessed through noise modelling based on the methodology, inputs and assumptions described above in **Chapter 2.** The resultant noise levels and comparison to the NMLs are presented in **Annex C** identified as SCN39 and 39B. SCN 39B has been modelled based on additional daytime movements (between 10am and 4pm).

The measured noise exposure and power levels presented in the **CSM-LOR-Noise Monitoring - SYAB Load Test** (V.02 dated 28/03/18) were considered during the preparation of this CNVIS. The measured values presented in the report were typical of the type of vehicles and load (empty, no material) that were observed during the noise measurements. It is expected that vehicle noise emissions would be higher when the heavy vehicle trays were not empty (i.e. contain material). Therefore the midpoint values for heavy vehicle sound power levels were adopted from the "typical sound levels of construction plant and equipment" identified in Table A1 of AS2436.

The highest predicted night-time noise levels range between 68 and 71 dBA at receptors R41 and R43. This is based on a volume of nine construction vehicle movements per hour, an upper limit identified by LOR. This volume of construction vehicle movements on the SYAB is proposed to occur 24 hours a day, seven days per week from late 2020 until the end of CSM works in 2022. In addition, up to 20 construction vehicle movements per hour on weekdays (Monday to Friday) between 10am to 4pm from mid-2019 until the end of the CSM works in 2022. Based on this increased daytime weekday traffic flow, the highest predicted day time noise levels range between 71 and 74 dBA at receptors R41 and R43.

Based on these predicted $L_{eq,\ 15\ minute}$ noise levels it is considered that the sleep disturbance screening criteria (L_{max}) of 59 dBA will be exceeded at the nearest and most sensitive residential receptors (i.e. R41 and R43) during OOHW. **Annex C** presents the additional mitigation requirements at each receptor where impacts are predicted. Recommendations for mitigation and management measures in relation to construction road traffic noise are outlined in **Chapter 8.**

The predicted noise levels for the bulk excavation period are conservative. The levels will be validated prior to the commencement of these works by measuring noise from heavy goods vehicles using the SYAB. At this stage, the

first such use is anticipated to occur in late 2018. Once the predicted heavy goods vehicle pass by event noise levels have been validated on site, the noise predictions will be updated.

In addition to the noise prediction verification process, practical noise mitigation measures will be fully investigated in order to reduce the noise level at the receiver. Any reasonable and feasible mitigation measures will be implemented and the noise predictions will be updated accordingly. Where Noise Management Levels are still predicted to be exceeded, additional noise management controls will be implemented in accordance with the CNVS.

5.3 CONSTRUCTION ROAD TRAFFIC (PUBLIC ROADS)

Based on the construction traffic anticipated to occur on public roads, with due regard to the assessment presented in the EIS, construction road traffic (noise and vibration) impacts from CSM works are not anticipated (i.e. from additional vehicles on the public road network).

Whilst the base criteria at Regent Street, Chalmers Street and Randle Street may be exceeded at times, the noise level increase ($L_{Aeq,\ period}$) associated with construction traffic is anticipated to comply with the 2 dBA increase allowance, therefore sensitive receptors are not likely to notice an increase in the average road traffic noise levels during construction.

In accordance with the RNP and the CNVS (as outlined in **Section 4.2)**, construction traffic NMLs are set at 2 dBA above the existing road traffic noise levels during the daytime and night-time periods and are considered appropriate to identify the onset of potential noise impacts. Where the road traffic noise levels are predicted to increase by more than 2 dBA as a result of construction traffic, consideration would be given to applying feasible and reasonable noise mitigation measures to reduce the potential noise impacts and preserve acoustic amenity.

When considering feasible and reasonable mitigation measures where the relevant noise increase is greater than 2 dBA, consideration should also be given to the actual noise levels associated with construction traffic and whether or not these levels comply with the road traffic noise criteria in the RNP and CNVS (refer **Section 4.2**).

It is assumed that the noise generated from heavy vehicles will have minimal impact to developments along their routes due to the metropolitan location of the project site. For arterial, sub-arterial and local roads (in the vicinity of the project), construction traffic will not generate a significant increase in vehicles when compared to that of the existing vehicle flows and mixes on the surrounding road network. It is anticipated that project heavy vehicles will be similar to other heavy vehicles (non-project) using Regent Street, Chalmers Street and Randle street.

It is however recommended that the construction road traffic noise mitigation measures identified in this CNVIS and the CNVMP are implemented to ensure that any residual impacts are minimised as far as is practically achievable.

5.4 POTENTIAL CUMULATIVE IMPACTS

As noted in **Chapter 4**, the NML are based on existing noise levels measured at locations surrounding the site and focus on the direct impacts from the site under assessment. Furthermore, cumulative construction noise impacts are beyond the control of LOR, are temporary in most circumstances.

Cumulative impacts may occur with other construction projects proposed for the area, therefore due care may be required of consent authorities to manage any works occurring concurrently. Where issues arise associated with nearby construction works (e.g. Sydney Light Rail and Sydney Trains maintenance) cumulative impacts will be managed through the community consultation process as outlined in **Section 2.4**. In accordance with **CoA – E39** LOR consult with proponents of other construction works in the vicinity of the CSM project and take reasonable steps to coordinate works to minimise cumulative impacts of noise and vibration and maximise respite for affected sensitive receptors.

6 GROUND-BORNE NOISE IMPACT ASSESSMENT

This chapter outlines the ground-borne noise impact assessment results and findings as relevant to the CSM project.

6.1 GROUND-BORNE CONSTRUCTION NOISE

With respect to the construction plant identified in the assessment scenarios presented in **Annex B**, the highest levels of ground-borne noise would be expected to occur due to construction activities involving excavators with hydraulic hammers / rock breakers and road headers.

These activities have been identified to occur during the following above ground scenarios; SCN16 – SCN20 and SCN23. Potential ground-borne noise generating activities have also been identified in the following underground scenarios; U-SCN01, U-SCN03, U-SCN05 and U-SCN09. A summary of these Scenarios is provided in **Table 6.1** below.

Table 6.1 Summary of Ground –Borne Noise Scenarios

SCN ID	Area Of Works	Description	Schedule
SCN16D SCN16E	Central Walk	Construction of Olympic Stairs (Temp) - Platform 20/21 and 22/23	Standard + OOHW Jul 2018 - Dec 2018
SCN17		Construction of the new Standby Guards Rooms / demolition of existing standby guards rooms	OOHW Jan 2019 - May 2019
SCN18		Construction of Platform Canopy Support System to Platforms 16 to 23 and Excavation of Launch Chambers	OOHW May 2019 - Oct 2021
SCN19		Platform works including works below the top slab	OOHW May2020 - Sept 2021
SCN20		Platform Remodelling works including platform canopy modifications	OOHW Dec 2021 - Sept 2022
SCN23	East Entrance	Demolition of the Bounce Hotel	Standard Hours Oct 2018 - Aug 2019
U-SCN01	Metro Box	Excavation to underside of Metro Concourse	Standard + OOHW Apr 2019 - Sept 2019
U-SCN03	Metro Box	Excavation to B2 Level	Standard + OOHW Nov 2019 - Apr 2020
U-SCN05	Metro Box	Excavation to B4	Standard + OOHW Aug 2020 - Oct 2020
U-SCN09	Central Walk	Excavation of the Central walk and Escalator Adits + FRP works	Standard + OOHW Aug 2020 - Apr 2022

As outlined in **Chapter 2**, ground-borne noise was assessed by predicting safe work distances utilising the indicative ground-borne noise levels identified in the EIS for road headers and rock breakers. These safe working distances are outlined in **Table 6.2** below.

Table 6.2 Ground –Borne Noise Safe Working Distances

Plant Item	Safe Working Distance – metres (m)			
	Residential Day	Residential Evening	Residential Night	Commercial Day
Rock Breakers	45 m	55 m	75 m	35 m
Road Headers	10 m	20 m	30 m	5 m

Source: EIS

1. Daytime means between 7:00am and 6:00pm, Monday to Sunday inclusive;
2. Evening means between 6:00pm and 10:00pm, Monday to Sunday inclusive; and
3. Night time means between 10:00pm to 7:00am, Monday to Sunday inclusive.

Based on the safe working distances presented in **Table 6.2** above, figures have been produced and provided in **Annex D** which display indicative safe working distances from the area of works that have been identified in **Table 6.1**.

Based on the indicative ground-borne noise levels identified in the EIS for road headers and rock breakers, the predicted ground-borne noise levels for a range of slant distances from the ground-borne noise source (point of impact) to the receptor are presented in **Table 6.3** below.

Table 6.3 Ground–Borne Noise Predictions

Slant Distance from Source to Receptor (m)	Ground-Borne Noise Level Leq (in dBA)	
	Rock Breaker	Road Header
5	90	50
10	75	45
15	66	41
20	62	38
25	57	37
30	53	35
35	50	33
40	48	32
45	45	31
50	43	30
55	40	29
60	39	28
65	37	27
70	37	27
75	35	26
80	33	26
85	32	25
90	30	25
95	29	25
100	28	24

Source: EIS

6.1.1 Discussion Of Results

As noted above high risk ground-borne noise activates are identified in a number of work scenarios. Based on the safe work distances (**Table 6.1**) the highest risk activity is associated with SCN23 (Demolition of the Bounce Hotel). This is due to the close proximity to the nearest sensitive receptors.

Where reasonable and feasible all works with the potential to generate ground-borne noise should be undertaken outside the safe working distances to avoid ground-borne noise impacts. However, due to the nature of the CSM project, complying with the recommended safe working distances presented **Table 6.1** may not be possible in all cases. This is typical of construction and demolition works in close proximity to other buildings and highlights the need to monitor and establish compliant levels during the early stages of ground-borne noise generating activities.

Attended measurements will be required at the commencement of ground-borne noise generating activities to confirm that noise levels satisfy the criteria for that activity. Respite periods should also be implemented for high noise generating activities in accordance with CoA E37 to 40.

Mitigation and management measures will be required to minimise impacts and will need to be implemented in conjunction with community and stakeholder consultation and notification processes outlined in the AMMM for Ground-borne noise in **Section 4.5**.

6.1.2 Summary Of Findings

Best-practice construction noise management and control techniques should be implemented to reduce ground-borne noise levels as far as practicable. Recommendations for mitigation and management measures in relation to ground-borne vibration are outlined in **Chapter 8.**

Where safe working distances are not achievable during the construction works, additional mitigation and management measures will also be warranted. These will need to be implemented in conjunction with community and stakeholder consultation and notification processes outlined in the AMMM for Ground-borne Vibration in **Section 4.5.**

For works outside the recommended standard hours for construction, letterbox drops, monitoring, respite offers and a range of other additional mitigation measures from the AMMM will be required at the most affected locations during select construction activities associated with the CSM project.

7 GROUND-BORNE VIBRATION IMPACT ASSESSMENT

This chapter outlines the ground-borne vibration impact assessment results and findings as relevant to the CSM project.

7.1 GROUND-BORNE CONSTRUCTION VIBRATION

With respect to the construction plant identified in the assessment scenarios presented in **Annex B**, the highest levels of vibration would be expected to occur due to construction activities involving vibratory rollers, jack hammers, excavators with hydraulic hammers / rock breakers, road headers and sheet piling. No blasting will be conducted on the Project.

These activities have been identified to occur during the following above ground scenarios; SCN06, SCN08, SCN10, SCN14, SCN16 – SCN23, SCN29, SCN30, SCN32, SCN34 and SCN36. Vibration generating activities have also been identified in the following underground scenarios; U-SCN01, U-SCN03, U-SCN05 and U-SCN09. A summary of these Scenarios is provided in **Table 7.1** below.

Table 7.1 Ground –Borne Noise Safe Working Distances

SCN ID	Area Of Works	Description	Schedule
SCN06	Platforms & Sydney Yard	Stage 13	Standard Hours Oct 2018
SCN08		Stage 15,17 & 19	Standard Hours Oct 2018
SCN10	Metro Box	FRP Capping Beam	Standard Hours Nov 2018 - Feb 2019
SCN14		Excavation to underside of Metro Concourse	Standard + OOHW Sept 2019 - Dec 2022
SCN16D SCN16E	Central Walk	Construction of Olympic Stairs (Temp) - Platform 20/21 and 22/23	Standard + OOHW Jul 2018 - Dec 2018
SCN17		Construction of the new Standby Guards Rooms / demolition of existing standby guards rooms	OOHW Jan 2019 - May 2019
SCN18		Construction of Platform Canopy Support System to Platforms 16 to 23 and Excavation of Launch Chambers	OOHW May 2019 - Oct 2021
SCN19		Platform works including works below the top slab	OOHW May2020 - Sept 2021
SCN20		Platform Remodelling works including platform canopy modifications	OOHW Dec 2021 - Sept 2022
SCN23	East Entrance	Demolition of the Bounce Hotel	Standard Hours Oct 2018 - Aug 2019
SCN29	Grand Concourse	Piling in Grand Concourse	OOHW Aug 2019 - Sep 2019
SCN30		FRP Pile caps	
SCN34	Northern Concourse	Demolition Southern Half	Standard Hours Mar 2020 - May 2020
SCN36		Demolition Northern Half	Standard Hours Feb 2021 - Mar2021

SCN ID	Area Of Works	Description	Schedule
U-SCN01	Metro Box	Excavation to underside of Metro Concourse	Standard + OOHW Apr 2019 - Sept 2019
U-SCN03	Metro Box	Excavation to B2 Level	Standard + OOHW Nov 2019 - Apr 2020
U-SCN05	Metro Box	Excavation to B4	Standard + OOHW Aug 2020 - Oct 2020
U-SCN09	Central Walk	Excavation of the Central walk and Escalator Adits + FRP works	Standard + OOHW Aug 2020 - Apr 2022

As outlined in **Chapter 2**, vibration was assessed based the applicable safe work distances published in the TfNSW CNS. These safe working distances are outlined in **Table 7.2** below.

Table 7.2 Ground –Borne Vibration Safe Working Distances

Plant Item	Rating/Description	Safe Working Distance – metres (m)	
		Cosmetic Damage (BS 7385)	Human Comfort (BS 6472)
Vibratory Roller	< 50 kN (Typically 1-2 tonnes)	5 m	15 m to 20 m
	< 100 kN (Typically 2-4 tonnes)	6 m	20 m
	< 200 kN (Typically 4-6 tonnes)	12 m	40 m
	< 300 kN (Typically 7-13 tonnes)	15 m	100 m
	> 300 kN (Typically 13-18 tonnes)	20 m	100 m
	> 300 kN (> 18 tonnes)	25 m	100 m
Small Hydraulic Hammer	(300 kg - 5 to 12t excavator)	2 m	7 m
Medium Hydraulic Hammer	(900 kg – 12 to 18t excavator)	7 m	23 m
Large Hydraulic Hammer	(1600 kg – 18 to 34t excavator)	22 m	73 m
Vibratory Pile Driver	Sheet piles	2 m to 20 m	20 m
Pile Boring	≤ 800 mm	2 m (nominal)	n/a
Jackhammer	Hand held	1 m (nominal)	Avoid contact with structure

Source: TfNSW CNS

Based on the BS 5228 method for predicting vibratory sheet piling outlined in **Section 2.1**. Predicted noise levels are presented in **Table 7.3** below. Predicted values comply with the most stringent BS 7385 criteria (15 mm/s) at

distances of 11 m and beyond. Therefore, this prediction provides a more accurately defined safe working distance of 11 m for the sheet piling activity.

Table 7.3 Predicted PPV (mm/s) Vibration Levels (Sheet Piling)

Distance, m	Predicted PPV, mm/s
1.0	266.0
2.0	115.8
3.0	71.2
4.0	50.4
5.0	38.6
6.0	31.0
7.0	25.7
8.0	21.9
9.0	19.0
10.0	16.8
11.0	**15.0**
12.0	13.5
13.0	12.3
14.0	11.2
15.0	10.3
16.0	9.5
17.0	8.9
18.0	8.3
19.0	7.8
20.0	7.3
21.0	6.9
22.0	6.5
23.0	6.2
24.0	5.9
25.0	5.6
50.0	2.4
75.0	1.5
100.0	1.1
200.0	0.5

Source: BS 5228

Based on the safe working distances presented above, figures have been produced and provided in **Annex D** which display indicative safe working distances from the area of works that have been identified in **Table 7.1**.

7.1.1 Discussion of Results

As noted above high risks for vibration impacts are anticipated a number of work scenarios. Where reasonable and feasible all vibration intensive works should be undertaken outside the cosmetic damage (BS7385) safe working distances to avoid structural vibration impacts.

However, due to the nature of the CSM project, complying with the recommended safe working distances for vibration intensive plant presented **Table 7.1** may not be possible in all cases. This is typical of construction and

demolition works in close proximity to other buildings and highlights the need to monitor and establish compliant levels during the early stages of vibration significant activities.

Attended vibration measurements are required at the commencement of vibration generating activities to confirm that vibration levels satisfy the criteria for that vibration generating activity. Where there is potential for exceedances of the criteria further vibration site law investigations would be undertaken to determine the site-specific safe working distances for that vibration generating activity. Continuous vibration monitoring with audible and visible alarms would be conducted at the nearest sensitive receivers whenever vibration generating activities need to take place inside the calculated safe-working distances.

As stated in **Section 2.1**, the Central Station buildings have been identified as state significant heritage structures in close proximity to the site and monitoring will therefore be required in the early stages of work to confirm that vibration levels satisfy the cosmetic damage criteria outlined in **Section 4.4** of this report, in accordance with the CNVS.

Demolition of Bounce Hotel identified in SCN23 will occur within the human comfort safe working distance of 7 m. Therefore it is anticipated that the human comfort criteria (BS6472) will be exceeded at times during this scenario. To minimise impacts to human comfort, additional mitigation and management measures will be warranted.

Respite periods should be implemented for high vibration generating activities in accordance with CoA E37 to E40. Due to the nature of site location and the identification of vibration sensitive equipment at receptors nearby. Vibration baseline monitoring will be required at the Dental Hospital and Central Station heritage structure (Electrical Building), prior to the commencement of construction works. The baseline data in combination with the VC curves presented in **Section 4.4** will ascertain project / equipment specific vibration goals.

These will need to be implemented in conjunction with community and stakeholder consultation and notification processes outlined in the AMMM for Ground-borne vibration in **Section 4.5**.

Guidance Note

This assessment has utilised the safe work distances for vibration generating construction activities and equipment established with due regard to the CNS. The CNS safe work distances were derived from BS7385 as relevant to cosmetic damage to buildings. BS7385 is a frequency (Hz) dependant criterion (less stringent at higher frequencies) and as such, works and activities may be able to occur at distances closer than those nominated in **Table 7.1** without any cosmetic or structural damage impacts occurring. Monitoring will be

required during vibration intensive activities to establish compliant levels during the early stages of CSM works.

7.1.2 Summary Of Findings

Best-practice construction vibration management and control techniques should be implemented to reduce vibration levels as far as practicable. Recommendations for mitigation and management measures in relation to ground-borne vibration are outlined in **Chapter 8.**

To minimise impacts to human comfort, additional mitigation and management measures will also be warranted. These will need to be implemented in conjunction with community and stakeholder consultation and notification processes outlined in the AMMM for Ground-borne Vibration in **Section 4.5.**

For works outside the recommended standard hours for construction, letterbox drops, monitoring and a range of other additional mitigation measures from the AMMM will be required at the most affected locations during select construction activities associated with CSM.

8 RECOMMENDATIONS

This chapter presents any recommendations for construction noise and/or vibration mitigation, community consultation, management measures or monitoring options.

The focus of this section is construction noise and vibration associated with the CSM project that have the potential to generate impacts at the closest and/or potentially most affected sensitive receptors or structures. Recommendations implemented to minimise impacts that these receptors will also assist to minimise impacts on the broader community.

The project-specific mitigation measures (refer **Section 8.3**) have been defined based on the activities proposed and potential impacts. "Standard" mitigation (and practices) applicable to the CSM project are described in **Section 8.1** below.

8.1 STANDARD MITIGATION MEASURES

The overall objective of construction noise and vibration management is to limit impacts on nearby receptors. This can be achieved by implementing the requirements of the CNVS which reflects the intent and purpose of the ICNG. Therefore, the following hierarchical approach should be used as far as practicable:

- Where site noise levels are above goals or criteria, implement reasonable and feasible good practice environmental controls to minimise noise and vibration emissions and/or exposure duration at affected receptors.
- Where the use of best practice environmental control mitigation measures do not adequately address exceedances of goals or criteria, adopt alternative measures to minimise impacts on the community.
- Liaise with the local community regarding scheduled works which are predicted to have increased impacts.

It is recommended that the standard noise mitigation measures presented in Section 7 of the CNVS be adopted for all works undertaken as part of the CSM project. The management, source control and path control measures applicable to air-borne noise should be implemented.

Prior to commencement of works, a Construction Noise and Vibration Management Plan (CNVMP) should be prepared and implemented in accordance with the requirements of the CNVS and this CNVIS. The CNVMP should take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where reasonable and feasible. At the time this CNVIS was prepared the

CNVMP was also being developed to incorporate the recommendations of this assessment.

Sydney Metro have also developed principles for managing construction noise and vibration. These principles will apply to the CSM project and are listed below:

- All personnel and community will be informed of the effort and methods undertaken to reduce noise and vibration for the works undertaken.
- Good engagement with the community will be maintained to facilitate effective project delivery with balanced community impacts.
- Construction noise and vibration levels at sensitive receptors will be minimised where feasible and reasonable.
- Feasible and reasonable mitigation will reflect the time of day, and the degree and duration of the impact.
- The community will be informed of the dates for the intended works, sequencing and timing of noisy events. Where possible this will include an indicative schedule over a 24 hour period.
- Minimising construction noise and vibration will be viewed as a continuous improvement exercise that is inclusive of stakeholders where no idea is too small to be considered.
- Any operational noise and vibration improvements resulting from the works will be promoted to the community.

8.2 PROJECT-SPECIFIC MITIGATION/MANAGEMENT MEASURES

In addition to the measures set out in Section 7 of the CNVS, any specific mitigation measures are to be identified in the CNVMP.

The following project-specific mitigation/management measures should be implemented to minimise impacts as far as is feasible and reasonable. It is recommended that:

- Alternative methods to rock hammering for excavation as part of detailed construction planning with a view to adopting methods that minimise impacts on sensitive receivers. The CNVIS will be updated for each location or activity to adopt the least impact alternative in any given location unless it can be demonstrated, to the satisfaction of the AA, why it should not be adopted.

- Alternative demolition techniques (i.e. Bounce Hotel) that minimise noise and vibration levels should be investigated and implemented where feasible and reasonable. This would include consideration of:

  - The use of hydraulic concrete shears in lieu of hammers/rock breakers.

  - Installing sound barrier screening to scaffolding facing noise sensitive neighbours.

  - Sequencing works to shield noise sensitive receptors by retaining scaffolding where reasonable and feasible.

  - Locating demolition load out areas away from the nearby noise sensitive receptors.

  - Providing respite periods for noise intensive works (in accordance with CoA E37 to E42)

  - Methods to minimise structural-borne noise to adjacent buildings including separating the structural connection prior to demolition through saw-cutting and propping, using hand held splitters and pulverisers or hand demolition.

  - Modifying demolition works sequencing / hours to minimise impacts during peak pedestrian times and / or adjoining neighbour outdoor activity periods.

- Construction hoarding should be erected around the following work areas as per the current construction design: Metro Box, Central Walk, and ESR.

- Any site buildings, equipment or other useful obstacles/objects should be positioned to act as a temporary barrier to minimise noise emissions towards the residential receptors situated in the first row of buildings surrounding the CSM project. Other barriers such as hoardings or temporary enclosures should also be used. Site emissions may be reduced by these barriers by between approximately 5 and 10 dBA.

- All mechanical plant and equipment is to be selected to provide quieter and less vibration emitting construction methods where feasible and reasonable.

- All mechanical plant and equipment is to be silenced by the best practical means using current technology. Mechanical plant, including noise-suppression devices, should be maintained to the manufacturer's specifications. Internal combustion engines are to be fitted with a suitable muffler in good repair.

- Extended periods of high noise level generating plant, equipment or machinery (excavators, hand tools, grinders etc.) should be avoided.

- The site be proactively managed to avoid un-necessary clustering of plant, equipment or machinery near receptors.

- The site should be orientated to minimise the need for reversing of equipment or vehicles, particularly during any out-of-hours work. Furthermore, less noisy movement/reversing warning systems for equipment and vehicles should be considered, especially if they will operate for extended periods or in close proximity to the most affected receptors. Occupational health and safety requirements for use of warning systems must be followed.

- All plant, equipment or machinery (and heavy vehicles, trucks etc.) should be turned off when not being used.

- In accordance with CoA – E34 noise generating works in the vicinity of potentially-affected, religious, educational, community institutions and noise and vibration-sensitive businesses and critical working areas (such as theatres, laboratories and operating theatres) must not be timetabled within sensitive periods, unless other reasonable arrangements to the affected institutions are made at no cost to the affected institution or as otherwise approved by the Secretary.

- In accordance with CoA – E33, consultation with sensitive receptors should be undertaken as the project progresses where sensitive periods can be refined based on the type of activities, expected impacts and the particular circumstances of the receptor at that time. All consultation should be undertaken prior to the start of the relevant portion of works predicted to affect those receptors. Mitigation measures can then be tailored based on the consultation feedback. Mitigation Consultation should be undertaken at receptors to which it applies prior to the activity commencing which has triggered it. Please refer to Annex E for the Consultation Register.

- Traffic management strategies should be developed prior to the commencement of construction for each site area and access/egress points to manage the impacts of construction road traffic noise.

- The following construction road traffic noise mitigation and management measures should be implemented: keep truck drivers informed of the designated vehicle routes, parking locations, acceptable delivery hours; instruct truck drivers to travel through local roads without stopping unless absolutely necessary. If for whatever reason, truck drivers need to stop on local roads they should position the vehicle away from residential dwellings and limit extended periods of engine idling; and instruct truck drivers to limit engine revving and use of exhaust brakes when travelling to and from site, especially whilst travelling on local roads.

- Real-time noise and vibration monitoring should be conducted across all works, including the night time period where sleep disturbance impacts are to be monitored. Vibration monitoring devices should be located on all

sensitive buildings and rail infrastructure throughout all vibration intensive works.

- Vibration monitoring is recommended at the commencement of vibration generating activities to confirm that vibration levels satisfy the criteria for that vibration generating activity. Where there is potential for exceedances of the criteria, further vibration site law investigations would be undertaken to determine the site-specific safe working distances for that vibration generating activity. Continuous vibration monitoring with audible and visible alarms should be conducted at the nearest sensitive receivers whenever vibration generating activities need to take place inside the calculated safe-working distances. Vibration monitoring requirements in accordance with the CoAs and CNVS are outlined in the CNVMP.

8.3 CONSTRUCTION HOURS

Works within the Recommended Standard Hours

Confining construction activities (including the delivery of plant and equipment) to the recommended standard hours for construction wherever feasible and reasonable helps reduce impacts by limiting potentially noisy construction activities to the daytime, when background noise levels are higher, and by providing respite from construction noise during the evening, overnight and on weekends.

It is recommended that construction works should be limited as far as possible to the recommended standards hours for construction, these are Monday to Friday 7am to 6pm; Saturday 8am to 1pm; and no work on Sundays or public holidays.

It is recommended that respite periods (especially for high noise generating works or activities such as sheet piling and demolition) should be considered during the detailed design of the construction methodology as per the requirements of the CNVS.

The CNVMP details applicable CoAs relating to hours of work and also includes CoAs with relation to impacted business. CoA – E34 states that noise generating works in the vicinity of potentially-affected, religious, educational, community institutions and noise and vibration-sensitive businesses and critical working areas (such as theatres, laboratories and operating theatres) must not be timetabled within sensitive periods, unless other reasonable arrangements to the affected institutions are made at no cost to the affected institution or as otherwise approved by the Secretary.

In accordance with CoA – E33, consultation with sensitive receptors will be undertaken as the project progresses where sensitive periods can be refined based on the type of activities, expected impacts and the particular

circumstances of the receptor at that time. All consultation will be undertaken prior to the start of the relevant portion of works predicted to affect those receptors. Mitigation measures can then be tailored based on the consultation feedback. Mitigation Consultation will be undertaken at receptors to which it applies prior to the activity commencing which has triggered it. The CNVIS will be updated and reissued to the AA and ER for endorsement at least four weeks prior to commencement of a particular scenario as the project progresses and consultation continues over the life of the project. Please refer to Appendix E for the Consultation Register.

Works outside the Recommended Standard Hours

Works outside the recommended hours for construction will be required due to the CSM project's proximity to an operational rail network; to maintain a safe working environment and minimise disruption to commuters.

Any works that become necessary outside the standard hours should be justified and additional mitigation measures (refer **Section 8.4**) implemented to reduce noise impacts to acceptable levels.

In addition, an out-of-hours work application should be completed for all applicable works and activities in accordance Section 5.2 of the CNVS.

It is recommended that respite periods (especially for high noise generating works or activities during the night time) should be considered during the detailed design of the construction methodology as per the requirements of the CNVS.

8.4 ADDITIONAL MITIGATION MEASURES

The assessment has identified that works undertaken inside the recommended standard hours for construction will generate potentially intrusive noise emissions with the potential to exceed the Highly Noise Affected Management Levels.

Section 8 of the CNVS identifies a method by which additional mitigation measures may be considered and developed depending on the extent of the exceedance and comparison to existing background L_{A90} noise levels, as summarised in **Section 4.5** and reproduced in **Table 4.8** of this CNVIS. This method is the basis of the construction noise assessment and the recommendations provided here.

It is recommended that additional mitigation measures be developed for works within the recommended standard hours for construction as per the requirements of the CNVS and informed by the results presented in **Annex C**.

It is recommended that additional measures should be developed for works outside the recommended standard hours for construction as per the requirements of the CNVS and informed by the results presented in **Annex C**. These measures should consider the potential for sleep disturbance impacts that could occur during the night time period due to peak or maximum noise level events.

Any additional measures deemed necessary should be considered, evaluated and addressed during the preparation of the CNVMP required for the CSM project, prior to works commencing and in any subsequent out-of-hours work applications.

Extent of Additional Mitigation

The locations at which additional mitigation measures should be implemented will vary within for each phase of work. Not all receptors will qualify for the same level of mitigation, and some receptors do not require further consideration for any additional mitigation measures.

The additional mitigation is generally limited to the closest buildings (e.g. first row of buildings) situated in the vicinity of the CSM project, as identified in the results presented in **Annex C**. Furthermore, the additional mitigation established in this circumstance is only required for residential receptors.

Therefore, it is recommended that the type and extent of any additional mitigation measures be established in accordance with the requirements of the CNVS but evaluated in the context of the broader community consultation program i.e. in conjunction with community and stakeholder consultation and notification processes.

Furthermore, these measures should be validated during the preparation of the CNVMP (and any subsequent out-of-hours work applications) and confirmed to be suitable and effective during works.

8.5 MAXIMUM LEVELS FOR PLANT AND EQUIPMENT

It is recommended that plant, equipment and machinery noise levels should not exceed the maximum allowable noise levels for construction equipment presented in Table 11 of the CNVS or those presented in this report, whichever is the lowest value. This will insure that noise levels above those predicted here do not occur.

Where values lower than those modelled are achieved a noise level reduction to the predicted values presented in this report will occur. For example, if equipment is selected so that an overall reduction of 10 dBA is achieved, then noise levels at nearby receptors will also reduce by approximately 10 dBA.

Safe Working Distances for Vibration

It is recommended that the safe working distances for vibration intensive activities be applied to all works undertaken as part of the project, as far as practicable.

Importantly, where vibration intensive works are undertaken within 25m of a residential (dwelling) receptor, monitoring of off-site vibration should be conducted to determine if vibration levels are perceptible. If they are not perceptible, then no further action is required. If they are perceptible, then the management, source control and path control measures applicable to ground-borne vibration, or respite periods, should be implemented. It should also be noted that, based on the existing vibration monitoring data and established vibration goals, vibration monitoring for sensitive equipment may be required even when levels are not perceptible.

8.6 NOISE AND VIBRATION MONITORING REQUIREMENTS

A noise monitoring program is to be carried out for the duration of the works in accordance with the requirements specified in the CNVMP prepared for the CSM project, and any approval and licence conditions.

The methodology for any construction monitoring should be determined by a suitably qualified acoustics engineer, the findings of this CNVIS should inform the monitoring locations and frequency, amongst other key features.

Monitoring for CSM works should be implemented at the commencement of works and at regular intervals throughout the project (i.e. when new construction activities commence) to quantify the air-borne noise, ground-borne noise and vibration levels associated with construction activities. Monitoring would also be required in the event of a complaint being received and should be conducted at the most affected receptor in accordance with Appendix A of the CNVS.

In accordance with **CoA - C11** unattended real-time noise and vibration monitoring will the focus of monitoring however attended noise and vibration monitoring may be undertaken where specific circumstances warrant (i.e. where triggered by the AMMM outlined in **Section 4.5**).

Any noise monitoring that is undertaken should compare the measured site noise level contributions, determined in the absence of any influential source not associated with the CSM project to the predicted noise levels presented in this CNVIS.

Operator attended noise measurements are preferred (due to the influence of existing ambient noise sources) and are to be undertaken to confirm that the actual measured noise levels are consistent with the predictions in this CNVIS.

Attended noise measurements are recommended at the potentially most affected receptor(s) from the commencement of construction activities to confirm that the noise levels (air-borne and ground-borne) in the adjacent community are consistent with the predictions this CNVIS. Other potentially affected receptors should also be considered as part of the monitoring regime depending on the phase of works.

At this stage noise monitoring should be targeted at the commencement of each new construction activity/phase of work to verify the predicted noise levels. Continued monitoring of work phases and activities would then be considered on a case by case basis, or where triggered by the AMMM.

Vibration monitoring is recommended at the commencement of vibration generating activities to confirm that vibration levels satisfy the criteria for that vibration generating activity. Where there is potential for exceedances of the criteria, further vibration site law investigations would be undertaken to determine the site-specific safe working distances for that vibration generating activity.

Continuous vibration monitoring (attended or unattended with audible and visible alarms) should be conducted at the nearest sensitive receptors whenever vibration generating activities need to take place inside the calculated safe-working distances.

At this stage vibration monitoring should be targeted to heritage and rail structures within central station as well as buildings adjacent to the bounce hotel demolition. Monitoring should also focus on sensitive medical/scientific equipment located at the Dental Hospital. Monitoring of other work phases and activities should be considered on a case by case basis (i.e. if vibration generating activities are required). Monitoring devices should be located on sensitive buildings and rail infrastructure where vibration intensive works are required within safe working distances.

9 *CONCLUSION*

ERM was engaged by LOR to complete a CNVIS for construction aspects of the project as part of the CSM project. The assessment was conducted to achieve a scope of works that allowed for the successful identification of potential receptors situated in the vicinity of site emission sources and identification of significant noise and vibration generating plant, equipment and/or activities associated with the CSM works and their likely/known emissions.

Existing ambient and background noise levels in the area were quantified and noise and vibration criteria developed in accordance with recognised NSW standards and guidelines as applicable to the CSM activities, and developed applicable assessment scenarios.

Potential impacts associated with construction road traffic noise were qualitatively assessed and as outlined in the EIS, no impacts are anticipated. A quantitative construction noise and vibration impact assessment was then conducted by predicting noise levels via modelling and by estimating vibration and ground-borne noise levels. The predictions were conducted for applicable assessment scenarios. Resultant noise levels were then compared to project-specific criteria or management levels at each receptor location and any exceedances identified. Resultant ground-borne noise and vibration levels were used to determine safe working distances at which project-specific criteria or management levels will not be exceeded.

A summary of the results and findings are presented in **Chapter 5 to Chapter 7** of this CNVIS. The full set of noise modelling results and findings are presented in **Annex C**. Although a number of exceedances are identified, these are associated with predicted 15 minute noise values calculated via modelling for the purposes of the assessment, in accordance with the ICNG and the CNVS. These values do not represent a constant noise emission that would be experienced by the community on a daily basis throughout the CSM project.

Based on these findings, recommendations have been made for noise and vibration mitigation, management measures and/or monitoring options suitable to the significance of the predicted impacts and designed to minimise impacts as far as is feasible and reasonable.

Construction noise and vibration levels will be reduced and impacts minimised with the successful implementation of the recommendations provided in **Chapter 8** of this report. Impacts may not be reduced to negligible levels for all receptors during all construction activities; however the recommendations presented here will ensure that any residual impacts are minimised as far as is practically achievable. These recommendations will need to be implemented in conjunction with community and stakeholder consultation and notification processes.

REFERENCES

British Standard – BS5228-2:2009+A1:2014 (BS5228) – **Code of Practice for Noise and Vibration Control on Construction and Open Sites** – Part 2: Vibration.

British Standard (BS 6472–1992) – **Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz)** dated 1992.

British Standard BS7385: Part 2-1993 (BS 7385) - **Evaluation and Measurement for Vibration in Buildings** — Part 2 – Guide to Damage Levels from Ground-borne Vibration, dated 1993.

Degnan Constructions Pty Ltd - Sydney to Burwood Compressor House Detailed Design Operational Noise Assessment, prepared by GHD Pty Ltd, dated November 2012 (GHD 2012).

German Institute for Standardisation – DIN 4150 (1999-02) Part 3 (DIN4150:3) – **Structural Vibration - Effects of Vibration on Structures**, dated 1999.

International Organisation for Standardisation (ISO) 9613-2:1996 (ISO9613:2) - **Acoustics - Attenuation of Sound during Propagation Outdoors** - Part 2: General Method of Calculation.

Laing O'Rourke (LOR), Sydney Metro City and Southwest – Central Station Main Works, **Technical Report - Noise Monitoring – SYAB Load Tests**, 28 March 2018.

NSW Department of Environment and Climate Change – N**SW Interim Construction Noise Guideline** (ICNG), July 2009.

NSW Department of Environment and Conservation – **NSW Environmental Noise Management – Assessing Vibration: a Technical Guideline** (the NSW Vibration Guideline), February 2006.

NSW Department of Environment, Climate Change and Water – **NSW Road Noise Policy** (RNP), March 2011.

NSW Environment Protection Authority – **NSW Environmental Noise Management – Industrial Noise Policy** (INP), January 2000 and relevant application notes.

NSW Government – Transport for NSW (TfNSW) - **Sydney Metro Construction Noise and Vibration Strategy** (CNVS), August 2016 and CNVS Addendum August 2017.

NSW Government – Transport for NSW (TfNSW) **Construction Noise Strategy** (7TP-ST-157/3.0 or CNS), dated July 2016.

Standards Australia AS1055–1997™ (AS1055) – **Description and Measurement of Environmental Noise**.

Standards Australia AS 2436–2010™ (AS2436) – **Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites**.

Sydney Yard Access Bridge (SYAB) – **Noise Monitoring Summary Report**, prepared by Environmental Resources Management (ERM) Pty Ltd, dated April 2018.

TfNSW – Power supply Upgrade Program – Lee Street Substation Noise and Vibration Assessment prepared by GHD Pty Ltd, dated February 2014 (GHD 2014).

TfNSW - Sydney Metro - Chatswood to Sydenham **Community Communications Strategy** – Early Works, dated October 2017.

TfNSW - Sydney Metro - Chatswood to Sydenham **Construction Environmental Management Framework** (CEMF) – Appendix B of SPIR, dated August 2016.

TfNSW - Sydney Metro - Chatswood to Sydenham **Environmental Impact Statement (EIS) – Chapter 10: Construction Noise and Vibration**, dated May 2016.

TfNSW - Sydney Metro - Chatswood to Sydenham **Environmental Impact Statement (EIS) – Technical Paper 2 Noise and Vibration**, Prepared by SLR, dated April 2016.

Annex A

Acoustics Glossary

A.1 GLOSSARY – ACOUSTICAL CONCEPTS AND TERMINOLOGY

A.1.1 What Is Noise And Vibration?

Noise

Noise is often defined as a sound, especially one that is loud or unpleasant or that causes disturbance[1] or simply as unwanted sound, but technically, noise is the perception of a series of compressions and rarefactions above and below normal atmospheric pressure.

Vibration

Vibration refers to the oscillating movement of any object. In a sense noise is the movement of air particles and is essentially vibration, though in regards to an environmental assessment vibration is typically taken to refer to the oscillation of a solid object(s). The impact of noise on objects can lead to vibration of the object, or vibration can be experienced by direct transmission through the ground, this is known as ground-borne vibration.

Essentially, noise can be described as what a person hears, and vibration as what they feel.

A.1.1 What Factors Contribute To Environmental Noise?

The noise from an activity, like construction works, at any location can be affected by a number of factors, the most significant being:

- how loud the activity is;
- how far away the activity is from the receiver;
- what type of ground is between the activity and the receiver location e.g. concrete, grass, water or sand;
- how the ground topography varies between the activity and the receiver (is it flat, hilly, mountainous) as blocking the line of sight to a noise source will generally reduce the level of noise; and
- any other obstacles that block the line of sight between the source to receiver e.g. buildings or purpose built noise walls.

A.1.2 How to Measure and Describe Noise?

Noise is measured using a specially designed 'sound level' meter which must meet internationally recognised performance standards. Audible sound pressure levels vary across a range of 10^7 Pascals (Pa), from the threshold of hearing at 20μPa to the threshold of pain at 200Pa. Scientists have defined a statistically described logarithmic scale called Decibels (dB) to more manageably describe noise.

To demonstrate how this scale works, the following points give an indication of how the noise levels and differences are perceived by an average person:

- 0 dB - represents the threshold of human hearing (for a young person with ears in good condition).
- 50 dB – represents average conversation.
- 70 dB – represents average street noise, local traffic etc.
- 90 dB – represents the noise inside an industrial premises or factory.
- 140 dB - represents the threshold of pain – the point at which permanent hearing damage may occur.

A.1.3 Human Response to Changes in Noise Levels

The following concepts offer qualitative guidance in respect of the average response to changes in noise levels:

- Differences in noise levels of less than approximately 2 dBA are generally imperceptible in practice. An increase of 2 dB is hardly perceivable.
- Differences in noise levels of around 5 dBA are considered to be significant.
- Differences in noise levels of around 10 dBA are generally perceived to be a doubling (or halving) of the perceived loudness of the noise. An increase of 10 dB is perceived as twice as loud. Therefore an increase of 20 dB is four times as loud and an increase of 30 dB is eight times as loud etc.
- The addition of two identical noise levels will increase the dB level by about 3 dB. For example, if one car is idling at 40 dB and then another identical car starts idling next to it, the total dB level will be about 43 dB.
- The addition of a second noise level of similar character which is at least 8 dB lower than the existing noise level will not add significantly to the overall dB level.

- A doubling of the distance between a noise source and a receiver results approximately in a 3 dB decrease for a line source (for example, vehicles travelling on a road); and a 6 dB decrease for a point source (for example, the idling car discussed above). A doubling of traffic volume for a line source results approximately in a 3 dB increase in noise, halving the traffic volume for a line source results approximately in a 3 dB decrease in noise.

A.1.4 Terms to Describe the Perception of Noise

The following terms offer quantitative and qualitative guidance in respect of the audibility of a noise source:

- **Inaudible / Not Audible** - the noise source and/or event could not be heard by the operator, masked by extraneous noise sources not associated with the source. If a noise source is 'inaudible' its noise level may be quantified as being less than the measured L_{A90} background noise level, potentially by 10 dB or greater.

- **Barely Audible –** the noise source and/or event are difficult to define by the operator, typically masked by extraneous noise sources not associated with the source. If a source is 'barely audible' its noise level may be quantified as being 5 - 7 dB below the measured L_{A90} or L_{Aeq} noise level, depending on the nature of the source e.g. constant or intermittent.

- **Just Audible** – the noise source and/or event may be defined by the operator. However there are a number of extraneous noise sources contributing to the measurement. The noise level should be quantified based on instantaneous noise level contributions, noted by the operator.

- **Audible** - the noise source and/or event may be easily defined by the operator. There may be a number of extraneous noise sources contributing to the measurement. The noise level should be quantified based on instantaneous noise level contributions, noted by the operator.

- **Dominant –** the noise source and/or event are noted by the operator to be significantly 'louder' than all other noise sources. The noise level should be quantified based on instantaneous noise level contributions, noted by the operator.

The following terms offer qualitative guidance in respect of acoustic terms used to describe the frequency of occurrence of a noise source during an operator attended environmental noise measurements:

- **Constant –** this indicates that the operator has noted the noise source(s) and/or event to be constantly audible for the duration of the noise measurement e.g. an air-conditioner that runs constantly during the measurement.

- **Intermittent** – this indicates that the operator has noted the noise source(s) and/or event to be audible, stopping and starting intervals for the duration of the noise measurement e.g. car pass-bys.

- **Infrequent** – this indicates that the operator has noted the noise source(s) and/or event to be constantly audible, however; not occurring regularly or at intervals for the duration of the noise measurement e.g. a small number of aircraft are noted during the measurement.

A.1.5 How to Calculate or Model Noise Levels?

There are two recognised methods which are commonly adopted to determine the noise at particular location from a proposed activity. The first is to undertake noise measurements whilst the activity is in progress and measure the noise, the second is to calculate the noise based on known noise emission data for the activity in question.

The second option is preferred as the first option is largely impractical in terms of cost and time constraints, notwithstanding the meteorological factors that may also influence its quantification. Furthermore, it is also generally considered unacceptable to create an environmental impact simply to measure it. In addition, the most effective mitigation measures are determined and implemented during the design phase and often cannot be readily applied during or after the implementation phase of a project.

Because a number of factors can affect how 'loud' a noise is at a certain location, the calculations can be very complex. The influence of other ambient sources and the contribution from a particular source in question can be difficult to ascertain. To avoid these issues, and to quantify the direct noise contribution from a source/site in question, the noise level is often calculated using noise modelling software packages. The noise emission data used in may be obtained from the manufacturer or from ERM's database of measured noise emissions.

A.1.6 Acoustic Terminology & Statistical Noise Descriptors

Environmental noise levels such as noise generated by industry, construction and road traffic are commonly expressed in dBA. The A-weighting scale follows the average human hearing response and enables comparison of the intensity of noise with different frequency characteristics. Time varying noise sources are often described in terms of statistical noise descriptors. The following descriptors are commonly used when assessing noise and are referred to throughout this acoustic assessment:

- **Decibel (dB is the adopted abbreviation for the decibel)** – The unit used to describe sound levels and noise exposure. It is equivalent to 10 times the logarithm (to base 10) of the ratio of a given sound pressure to a reference pressure.

- **dBA** - unit used to measure 'A-weighted' sound pressure levels. A-weighting is an adjustment made to sound-level measurement to approximate the response of the human ear.

- **dBC** – unit used to measure 'C-weighted' sound pressure levels. C-weighting is an adjustment made to sound-level measurements which takes account of low-frequency components of noise within the audibility range of humans.

- **dBZ or dBL** – unit used to measure 'Z-weighted' sound pressure levels with no weighting applied, linear.

- **Hertz (Hz)** - the measure of frequency of sound wave oscillations per second. 1 oscillation per second equals 1 hertz.

- **Octave –** a division of the frequency range into bands, the upper frequency limit.

- **1/3 Octave –** single octave bands divided into three parts.

- **Leq** - this level represents the equivalent or average noise energy during a measurement period. The $L_{eq, 15min}$ noise descriptor simply refers to the L_{eq} noise level calculated over a 15 minute period. Indeed, any of the below noise descriptors may be defined in this way, with an accompanying time period (e.g. $L_{10, 15\ minute}$) as required.

- **Lmax** - the absolute maximum noise level in a noise sample.

- **LN -** the percentile sound pressure level exceeded for N% of the measurement period calculated by statistical analysis.

- **L10 -** the noise level exceeded for 10 per cent of the time and is approximately the average of the maximum noise levels.

- **L90** - the noise level exceeded for 90 per cent of the time and is approximately the average of the minimum noise levels. The L_{90} level is often referred to as the "background" noise level and is commonly used as a basis for determining noise criteria for assessment purposes.

- **Sound Power Level (L_W)** - this is a measure of the total power radiated by a source. The Sound Power of a source is a fundamental property of the source and is independent of the surrounding environment.

- **Sound Pressure Level (L_P)** - the level of sound pressure; as measured at a distance by a standard sound level meter with a microphone. This differs from L_W in that this is the received sound as opposed to the sound 'intensity' at the source.

- **Background noise –** the underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed. This is described using the L_{A90} descriptor.

- **Ambient noise** – the all-encompassing noise associated within a given environment. It is the composite of sounds from many sources, both near and far. This is described using the L_{Aeq} descriptor.

- **Cognitive noise** – noise in which the source is recognised as being annoying.

- **Masking** – the phenomenon of one sound interfering with the perception of another sound. For example, the interference of traffic noise with use of a public telephone on a busy street.

Industrial Noise Policy (INP) Terminology

The following terminology is from the NSW Environment Protection Authority – *NSW Environmental Noise Management – Industrial Noise Policy* (INP), January 2000 and relevant application notes:

- **Assessment Background Level (ABL)** - is defined in the INP as a single figure background level representing each assessment period (day, evening and night). Its determination is by the tenth percentile method (of the measured L_{A90} statistical noise levels) described in Appendix B on the INP.

- **Rating Background Level (RBL)** - is defined in the INP as the overall single figure background level representing each assessment period (day, evening and night) over the whole monitoring period (as opposed to over each 24 hour period used for the ABL). This is the level used for assessment purposes. It is defined as the median value of:

  - all the day assessment background levels over the monitoring period for the day;

  - all the evening assessment background levels over the monitoring period for the evening; or

  - all the night assessment background levels over the monitoring period for the night.

- **Extraneous noise** – noise resulting from activities that are not typical of the area. Atypical INP activities may include construction, and traffic generated by holiday periods and by special events such as concerts or sporting events. Normal daily traffic is not considered to be extraneous.

- **Most affected location(s)** – locations that experience (or will experience) the greatest noise impact from the noise source under consideration. In determining these locations, one needs to consider existing background levels, exact noise source location(s), distance from source (or proposed source) to receiver, and any shielding between source and receiver.

- **Noise criteria** – the general set of non-mandatory noise level targets for protecting against intrusive noise (for example, background noise plus 5 dB) and loss of amenity (for example, noise levels for various land uses).

- **Noise limits** – enforceable noise levels that appear in conditions on consents and licences. The noise limits are based on achievable noise levels which the proponent has predicted can be met during the environmental assessment. Exceedance of the noise limits can result in the requirement for either the development of noise management plans or legal action.

- **Project Specific Noise Levels** – target noise levels for a particular noise generating facility. They are based on the most stringent of the intrusive criteria or amenity criteria. Which of the two criteria is the most stringent is determined by measuring the level and nature of existing noise in the area surrounding the actual or propose noise generating facility.

- **Compliance** – the process of checking that source noise levels meet with the noise limits in a statutory context.

- **Non-compliance** – development is deemed to be in non-compliance with its noise consent/ licence conditions if the monitored noise levels exceed its statutory noise limit by more than 2 dB.

- **Feasible and Reasonable measures** – feasibility relates to engineering considerations and what is practical to build; reasonableness relates to the application of judgement in arriving at a decision, taking into account the following factors:

    - noise mitigation benefits (amount of noise reduction provided, number of people protected);

    - cost of mitigation (cost of mitigation versus benefit provided);

    - community views (aesthetic impacts and community wishes); and

    - noise levels for affected land uses (existing and future levels, and changes in noise levels).

- **Meteorological Conditions** – wind and temperature inversion conditions.

- **Temperature Inversion** – an atmospheric condition in which temperature increases with height above the ground.

- **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).

A.1 VIBRATION - GLOSSARY OF TERMS, DEFINITIONS AND METHODOLOGY

A.1.1 How to Measure and Control Vibration

Vibration refers to the oscillating movement of any object. In relation to construction projects, ground-borne vibration is the most likely outcome of works and potentially has three (3) effects on vibration sensitive receivers, these are:

- Ground-borne vibration that may cause annoyance;
- Ground-borne vibration that may have adverse effect on a structure e.g. a building; and
- Regenerated noise due to ground-borne vibration.

Each of these potential effects can be assessed in accordance with the relevant standard. Perceptible levels of vibration often create concern for the surrounding community at levels well below structural damage guideline values; this issue needs to be managed as part of the vibration monitoring program.

Vibration is typically measured using specific devices that record the velocity or acceleration at a designated receiver location – usually being the closest premises to works. Modern vibration monitoring devices will typically capture amplitude data for the three (3) orthogonal axes being, the transverse, longitudinal and vertical and also the frequency at which the measured vibration event occurs.

Monitoring of this level of detail enables analysis of significant vibration events to determine compliance with relevant guidelines such as the NSW Department of Environment and Conservation – NSW Environmental Noise Management – *Assessing Vibration: a Technical Guideline* (the NSW vibration guideline), February 2006 and the German Institute for Standardisation – DIN 4150 (1999-02) Part 3 (DIN4150-3) – *Structural Vibration - Effects of Vibration on Structures*.

Vibration propagates in a different manner to noise and can be difficult to control depending on the frequency of the source in question, although identifying the strategy best suited to controlling vibration follows a similar approach to that of noise. This includes elimination, control at the source, control along the propagation path and control at the receiver and/or a combination of these, such as no work/respite periods.

A.1.2 Vibration Descriptors

The following terms are often used to describe measured vibration levels.

- **Parameter** – an attribute with a value - for example, weighting;

- **Particle Velocity** – the instantaneous value of the distance travelled by a particle per unit time in a medium that is displaced from its equilibrium state by the passage of a sound or vibration wave;

- **Peak Component Particle Velocity (PCPV)** – is the highest (maximum or peak) particle velocity which is recorded during a particular vibration event over the three (3) axes. PCPV is measured in the unit, mm/s;

- **Phase** – the relative position of a sound wave to some reference point, the phase of a wave is given in radians, degrees, or fractions of a wavelength;

- **Acceleration** – the change in velocity over time. Acceleration is dependent on the velocity and the frequency of the vibration event (velocity is a vector), as such acceleration changes in two ways - magnitude and/or direction. Acceleration is measured in the unit; m/s^2;

- **Perceptible** – vibration levels that a receiver of building occupant may 'feel'. 0.2mm/s is typically considered to be the human threshold for perception of vibration;

- **Geophone or accelerometer** – the transducer/device typically used to measure vibration;

- **Damage** – is defined in DIN 4150-3 to include minor non-structural effects such as cosmetic damage or superficial cracking in paint or cement render, the enlargement of cracks already present, and the separation of partitions or intermediate walls from load bearing walls;

- **Vibration Dose Value (VDV)** – a concept outlined in the NSW vibration guideline, which is a calculative approach to assessing the impact of intermittent vibration or extended periods of impulsive vibration. VDV require the measurement of the overall weighted RMS (Root Mean Square) acceleration levels over the frequency range 1Hz to 80Hz. To calculate VDV the following formula (refer Section 2.4.1 of the guideline) is used:

$$VDV = \left[\int_0^T a^4(t) dt \right]^{0.25}$$

  Where VDV is the vibration dose value in $m/s^{1.75}$, $a\ (t)$ is the frequency-weighted RMS of acceleration in m/s^2 and T is the total period of the day (in seconds) during which vibration may occur;

- **MIC** - Maximum Instantaneous Charge or explosive charge mass (kg) detonated per delay (any 8ms interval); and

- **SD** (m) - The scaled distance for air-blast and ground vibration from the charge to the receiver.

Annex B

Noise Modelling Data and Assessment Scenarios

Proposed Timeframe	Timing Details	Area of Works	Activity	Assessment Scenario ID	Potential Impacts	Equipment	LW, Actual	Quantity	Penalty	Duty Factor	LW, Modified (Q / P / DF)	Spectral Data - dBA per 1/1 Octave - Frequency in Hertz (Hz)								
												31.5	63	125	250	500	1000	2000	4000	80000
Aug 2018	WE06 Track Possession	Platforms & Sydney Yard	Stage 6 - Installing Services/Wiring	SCN 01-A	AB Noise	Hi Rail Truck	107.0	1.0	0.0	50%	104.0	59.7	85.1	89.4	95.8	99.1	96.4	98.4	87.4	80.6
				SCN 01-B	AB Noise	Hi Rail Manitou	104.0	1.0	0.0	100%	104.0	51.7	73.9	83.0	89.5	99.9	100.1	95.3	87.1	85.0
				SCN 01-C	AB Noise	5t Excavator	95.0	2.0	0.0	100%	98.0	55.5	76.2	84.9	87.5	92.8	93.8	89.1	83.8	76.6
				SCN 01-D	AB Noise	16t Excavator	105.0	1.0	0.0	100%	105.0	62.5	83.2	91.9	94.5	99.8	100.8	96.1	90.8	83.6
				SCN 01-E	AB Noise	Track Trolleys	90.0	2.0	0.0	50%	90.0	47.5	68.2	76.9	79.5	84.8	85.8	81.1	75.8	68.6
				SCN 01-F	AB Noise	Light Vehicles (Utes)	106.0	2.0	0.0	50%	106.0	75.1	83.1	91.2	93.6	98.9	101.6	100.1	94.3	89.0
Aug 2018	**WE06 Track Possession**	**Platforms & Sydney Yard**	**Stage 6 - Installing Services/Wiring**	**SCN 01**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**111.8**	**-**	**-**	**-**	**111.1**	**75.5**	**89.1**	**96.3**	**100.2**	**105.7**	**106.4**	**104.1**	**97.2**	**91.8**
Aug 2018	Weekend work	Platform 0	Stage 7 - Installing Services / Hoarding / Offices	SCN 02-A	AB Noise	6t Excavator	95.0	1.0	0.0	100%	95.0	52.5	73.2	81.9	84.5	89.8	90.8	86.1	80.8	73.6
				SCN 02-B	AB Noise	Concrete Agitator	109.0	2.0	0.0	100%	112.0	71.5	87.5	95.7	97.2	104.0	109.4	104.6	97.9	91.4
				SCN 02-C	AB Noise	120t Crane	105.0	1.0	0.0	50%	102.0	61.4	80.1	88.3	88.9	99.8	94.7	90.9	86.1	79.6
Aug 2018	**Weekend work**	**Platform 0**	**Stage 7 - Installing Services / Hoarding / Offices**	**SCN 02**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**110.6**	**-**	**-**	**-**	**112.5**	**72.0**	**88.4**	**96.6**	**98.0**	**105.5**	**109.6**	**104.8**	**98.3**	**91.8**
Aug - Oct 2018	Standard Construction Hours	Platforms & Sydney Yard	Stage 7, 9 & 11 - Combine Services Route / Demolition of Sydney Yard Buildings / Salvage Canopy / Remove Track / Remove Waste	SCN 03-A	AB Noise	6t Excavator	95.0	1.0	0.0	100%	95.0	52.5	73.2	81.9	84.5	89.8	90.8	86.1	80.8	73.6
				SCN 03-B	AB Noise	Elevated Work Platform (EWP)	105.0	1.0	0.0	50%	102.0	67.9	90.1	94.4	90.4	95.7	94.2	95.2	90.8	81.6
				SCN 03-C	AB Noise	20t Excavator With Munchers	105.0	2.0	5.0	100%	113.0	70.5	91.2	99.9	102.5	107.8	108.8	104.1	98.8	91.6
				SCN 03-D	AB Noise	Scissor Lift	90.0	2.0	0.0	50%	90.0	55.9	78.1	82.4	78.4	83.7	82.2	83.2	78.8	69.6
				SCN 03-E	AB Noise	Front End Loader	113.0	1.0	0.0	100%	113.0	74.2	85.4	101.5	106.7	105.5	106.7	106.7	98.3	94.2
				SCN 03-F	AB Noise	Trucks	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
Aug - Oct 2018	**Standard Construction Hours**	**Platforms & Sydney Yard**	**Stage 7, 9 & 11 - Combine Services Route / Demolition of Sydney Yard Buildings / Salvage Canopy / Remove Track / Remove Waste**	**SCN 03**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**115.0**	**-**	**-**	**-**	**116.7**	**76.6**	**95.3**	**104.6**	**108.7**	**110.6**	**111.3**	**109.6**	**102.3**	**96.5**
Sept 2018	WE10/11 Track Possession	Platforms 11/12/13	Stage 8 & 10 - OHW on Platform 11/12 / Replace Track Country End 12/13 / Installing CSR	SCN 04-A	AB Noise	6t Excavator	95.0	1.0	0.0	100%	95.0	52.5	73.2	81.9	84.5	89.8	90.8	86.1	80.8	73.6
				SCN 04-B	AB Noise	16t Excavator	105.0	1.0	0.0	100%	105.0	62.5	83.2	91.9	94.5	99.8	100.8	96.1	90.8	83.6
				SCN 04-C	AB Noise	Front End Loader	113.0	1.0	0.0	100%	113.0	74.2	85.4	101.5	106.7	105.5	106.7	106.7	98.3	94.2
				SCN 04-D	AB Noise	Elevated Work Platform (EWP)	105.0	2.0	0.0	50%	105.0	70.9	93.1	97.4	93.4	98.7	97.2	98.2	93.8	84.6
				SCN 04-E	AB Noise	Hi Rail Elevated Work Platform (EWP)	105.0	2.0	0.0	50%	105.0	70.9	93.1	97.4	93.4	98.7	97.2	98.2	93.8	84.6
				SCN 04-F	AB Noise	Hi Rail Truck	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
Sept 2018	**WE10/11 Track Possession**	**Platforms 11/12/13**	**Stage 8 & 10 - OHW on Platform 11/12 / Replace Track Country End 12/13 / Installing CSR**	**SCN 04**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**115.4**	**-**	**-**	**-**	**115.4**	**77.4**	**97.3**	**104.6**	**107.9**	**108.8**	**109.0**	**108.9**	**101.4**	**95.7**
Oct 2018	WE15 Track Possession	Platforms & Sydney Yard	Stage 12 - Piling Works / Removing Track	SCN 05-A	AB Noise	6t Excavator	95.0	1.0	0.0	100%	95.0	52.5	73.2	81.9	84.5	89.8	90.8	86.1	80.8	73.6
				SCN 05-B	AB Noise	16t Excavator	105.0	1.0	0.0	100%	105.0	62.5	83.2	91.9	94.5	99.8	100.8	96.1	90.8	83.6
				SCN 05-C	AB Noise	Piling Rig (Auger)	110.0	2.0	5.0	100%	118.0	71.0	85.7	107.5	108.8	109.9	113.5	111.9	102.8	96.0
				SCN 05-D	AB Noise	Front End Loader	113.0	2.0	0.0	100%	116.0	77.2	88.4	104.5	109.7	108.5	109.7	109.7	101.3	97.2
Oct 2018	**WE15 Track Possession**	**Platforms & Sydney Yard**	**Stage 12 - Piling Works / Removing Track**	**SCN 05**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**115.2**	**-**	**-**	**-**	**120.3**	**78.3**	**91.1**	**109.4**	**112.4**	**112.5**	**115.2**	**114.0**	**105.3**	**99.8**
Oct 2018	Standard Construction Hours	Platforms & Sydney Yard	Stage 13	SCN 06-A	AB Noise	20t Excavator With Munchers	105.0	2.0	5.0	100%	113.0	70.5	91.2	99.9	102.5	107.8	108.8	104.1	98.8	91.6
				SCN 06-B	AB Noise	5t Excavator	95.0	2.0	0.0	100%	98.0	55.5	76.2	84.9	87.5	92.8	93.8	89.1	83.8	76.6
				SCN 06-C	AB Noise / GB Vibration	Vibratory Roller	108.0	2.0	5.0	100%	116.0	65.4	83.6	98.7	109.2	109.6	110.8	109.0	100.8	94.7
Oct 2018	**Standard Construction Hours**	**Platforms & Sydney Yard**	**Stage 13**	**SCN 06**	**AB Noise / GB Vibration**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**109.9**	**-**	**-**	**-**	**117.8**	**71.7**	**92.0**	**102.4**	**110.1**	**111.8**	**113.0**	**110.3**	**103.0**	**96.5**
Oct 2018	Standard Construction Hours	Platforms & Sydney Yard	Stage 14, 16, 18 & 20	SCN 07-A	AB Noise	6t Excavator	95.0	2.0	0.0	100%	98.0	55.5	76.2	84.9	87.5	92.8	93.8	89.1	83.8	76.6
				SCN 07-B	AB Noise	16t Excavator	105.0	2.0	0.0	100%	108.0	65.5	86.2	94.9	97.5	102.8	103.8	99.1	93.8	86.6
				SCN 07-C	AB Noise	Piling Rig (Auger)	110.0	2.0	5.0	100%	118.0	71.0	85.7	107.5	108.8	109.9	113.5	111.9	102.8	96.0
Oct 2018	**Standard Construction Hours**	**Platforms & Sydney Yard**	**Stage 14, 16, 18 & 20**	**SCN 07**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**111.3**	**-**	**-**	**-**	**118.5**	**72.2**	**89.2**	**107.7**	**109.1**	**110.7**	**114.0**	**112.1**	**103.4**	**96.5**
Oct 2018	Standard Construction Hours	Platforms & Sydney Yard	Stage 15,17 & 19	SCN 08-A	AB Noise	20t Excavator With Munchers	105.0	1.0	5.0	100%	110.0	67.5	88.2	96.9	99.5	104.8	105.8	101.1	95.8	88.6
				SCN 08-B	AB Noise	5t Excavator	95.0	1.0	0.0	100%	95.0	52.5	73.2	81.9	84.5	89.8	90.8	86.1	80.8	73.6
				SCN 08-C	AB Noise / GB Vibration	Vibratory Roller	108.0	1.0	5.0	100%	113.0	62.4	80.6	95.7	106.2	106.6	107.8	106.0	97.8	91.7
				SCN 08-D	AB Noise	Piling Rig (Auger)	110.0	2.0	5.0	100%	118.0	71.0	85.7	107.5	108.8	109.9	113.5	111.9	102.8	96.0
Oct 2018	**Standard Construction Hours**	**Platforms & Sydney Yard**	**Stage 15,17 & 19**	**SCN 08**	**AB Noise / GB Vibration**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**113.0**	**-**	**-**	**-**	**119.7**	**73.0**	**90.7**	**108.1**	**111.0**	**112.4**	**115.1**	**113.2**	**104.6**	**97.9**
Oct 2018 - Feb 2019	Standard Construction Hours	Metro Box	Piling for the box perimeter and the plunge columns	SCN 09-A	AB Noise	Drill Rig (Bg-30)	113.0	4.0	5.0	100%	124.0	77.0	91.7	113.5	114.8	115.9	119.5	117.9	108.8	102.0
				SCN 09-B	AB Noise	14t Excavators	105.0	4.0	0.0	100%	111.0	68.5	89.2	97.9	100.5	105.8	106.8	102.1	96.8	89.6
				SCN 09-C	AB Noise	60t Crawler Crane	104.0	1.0	0.0	50%	101.0	63.4	74.5	84.1	86.3	94.0	94.0	89.9	97.3	86.9
				SCN 09-D	AB Noise	Concrete Agitator	112.0	3.0	0.0	100%	116.8	85.9	93.9	102.0	104.4	109.7	112.4	110.9	105.1	99.8
				SCN 09-E	AB Noise	Concrete Line Pump	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 09-F	AB Noise	Truck And Dogs	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
				SCN 09-G	AB Noise	Delivery Trucks	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
Oct 2018 - Feb 2019	**Standard Construction Hours**	**Metro Box**	**Piling for the box perimeter and the plunge columns**	**SCN 09**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**117.7**	**-**	**-**	**-**	**125.2**	**86.6**	**98.1**	**114.0**	**115.5**	**117.5**	**120.7**	**119.0**	**110.9**	**104.5**
Nov 2018 - Feb 2019	Standard Construction Hours	Metro Box	FRP Capping Beam	SCN 10-A	AB Noise	20t Excavator	105.0	1.0	0.0	100%	105.0	62.5	83.2	91.9	94.5	99.8	100.8	96.1	90.8	83.6
				SCN 10-B	AB Noise / GB Vibration	Jackhammer	113.0	4.0	5.0	100%	124.0	85.1	99.9	112.6	115.3	116.8	118.7	117.8	110.9	103.2
				SCN 10-C	AB Noise	5t Excavators	95.0	2.0	0.0	100%	98.0	55.5	76.2	84.9	87.5	92.8	93.8	89.1	83.8	76.6
				SCN 10-D	AB Noise	Concrete Agitator	112.0	2.0	0.0	100%	115.0	84.1	92.1	100.2	102.6	107.9	110.6	109.1	103.3	98.0
				SCN 10-E	AB Noise	20m Boom Pump	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 10-F	AB Noise	Hand Held Vibrators	113.0	2.0	5.0	100%	121.0	70.4	88.6	103.7	114.2	114.6	115.8	114.0	105.8	99.7
				SCN 10-G	AB Noise	Hand Held Masonry Drills	102.0	3.0	0.0	100%	106.8	63.5	87.2	92.3	92.0	102.6	102.7	98.0	86.3	76.2
				SCN 10-H	AB Noise	Fuel Trucks	107.0	2.0	0.0	50%	107.0	60.0	79.2	91.3	99.8	101.2	102.4	98.6	91.4	78.3
Nov 2018 - Feb 2019	**Standard Construction Hours**	**Metro Box**	**FRP Capping Beam**	**SCN 10**	**AB Noise / GB Vibration**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**118.7**	**-**	**-**	**-**	**126.4**	**87.8**	**101.2**	**113.5**	**118.1**	**119.5**	**121.3**	**119.9**	**112.8**	**105.7**

Proposed Timeframe	Timing Details	Area of Works	Activity	Assessment Scenario ID	Potential Impacts	Equipment	LW, Actual	Quantity	Penalty	Duty Factor	LW, Modified (Q / P / DF)	Spectral Data - dBA per 1/1 Octave - Frequency in Hertz (Hz)								
												31.5	63	125	250	500	1000	2000	4000	80000
Jan 2019 - Jun 2019	Standard Construction Hours	Metro Box	Excavation to underside of Intercity Slab	SCN 11-A	AB Noise	20t Excavators	105.0	6.0	0.0	100%	112.8	70.3	91.0	99.7	102.3	107.6	108.6	103.9	98.6	91.4
				SCN 11-B	AB Noise	Truck And Dog	107.0	3.0	0.0	50%	108.8	64.5	89.9	94.2	100.6	103.9	101.2	103.2	92.2	85.4
				SCN 11-C	AB Noise	Water Cart	107.0	1.0	0.0	50%	104.0	66.8	83.3	84.0	84.4	89.6	103.2	93.2	87.6	78.6
				SCN 11-D	AB Noise	Pozi Track	104.0	1.0	0.0	100%	104.0	51.7	73.9	83.0	89.5	99.9	100.1	95.3	87.1	85.0
				SCN 11-E	AB Noise	Concrete Agitator	112.0	1.0	0.0	100%	112.0	81.1	89.1	97.2	99.6	104.9	107.6	106.1	100.3	95.0
				SCN 11-F	AB Noise	Shotcrete Machine	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 11-G	AB Noise	10t/S Water Treatment Plant	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 11-H	AB Noise	2 Inch Dewatering Pumps	91.0	10.0	0.0	100%	101.0	60.5	76.5	84.7	86.2	93.0	98.4	93.6	86.9	80.4
				SCN 11-I	AB Noise	Sucker Truck	116.0	1.0	5.0	100%	121.0	78.7	99.9	109.0	110.5	113.9	116.1	115.3	106.1	101.0
Jan 2019 - Jun 2019	**Standard Construction Hours**	**Metro Box**	**Excavation to underside of Intercity Slab**	**SCN 11**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**119.4**	**-**	**-**	**-**	**122.8**	**83.8**	**101.4**	**110.1**	**112.0**	**116.0**	**118.3**	**116.7**	**108.4**	**102.9**
Feb 2019 - Jul 2019	Standard Construction Hours	Metro Box	FRP Platform and Intercity slab	SCN 12-A	AB Noise	20m Boom Pump	109.0	1.0	0.0	100%	109.0	66.5	87.2	95.9	98.5	103.8	104.8	100.1	94.8	87.6
				SCN 12-B	AB Noise	Concrete Agitator	112.0	3.0	0.0	100%	116.8	85.9	93.9	102.0	104.4	109.7	112.4	110.9	105.1	99.8
				SCN 12-C	AB Noise	Concrete Vibrators	103.0	3.0	5.0	100%	112.8	72.3	88.3	96.5	98.0	104.8	110.2	105.4	98.7	92.2
				SCN 12-D	AB Noise	Concrete Helicopter / Finishing Machine	106.0	1.0	0.0	100%	106.0	65.5	81.5	89.7	91.2	98.0	103.4	98.6	91.9	85.4
				SCN 12-E	AB Noise	60t Crawler	104.0	1.0	0.0	50%	101.0	63.4	74.5	84.1	86.3	94.0	94.0	89.9	97.3	86.9
				SCN 12-F	AB Noise	Telehandlers	113.0	2.0	0.0	100%	116.0	77.2	88.4	104.5	109.7	108.5	109.7	109.7	101.3	97.2
				SCN 12-G	AB Noise	Welding Machines	105.0	2.0	0.0	50%	105.0	70.9	93.1	97.4	93.4	98.7	97.2	98.2	93.8	84.6
				SCN 12-H	AB Noise	6 Inch Circular Saw	117.0	10.0	5.0	50%	129.0	81.9	96.6	120.7	119.7	120.7	124.2	122.5	113.4	106.8
				SCN 12-I	AB Noise	130 Cfm Compressor	100.0	3.0	0.0	100%	104.8	78.5	87.7	93.8	96.3	98.7	97.9	99.1	89.9	83.8
				SCN 12-J	AB Noise	Explosive Nail Guns	116.0	5.0	0.0	100%	123.0	84.1	98.9	111.6	114.3	115.8	117.7	116.8	109.9	102.2
				SCN 12-K	AB Noise	Small Tools (Hammers, Drills Etc)	102.0	3.0	0.0	100%	103.8	60.5	84.2	89.3	89.0	99.6	99.7	95.0	83.3	73.2
Feb 2019 - Jul 2019	**Standard Construction Hours**	**Metro Box**	**FRP Platform and Intercity slab**	**SCN 12**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**121.7**	**-**	**-**	**-**	**130.5**	**89.8**	**103.0**	**121.4**	**121.3**	**122.5**	**125.6**	**124.1**	**115.9**	**109.2**
Apr 2019 - Sept 2019	Day and Night Works	Metro Box	Excavation to underside of Metro Concourse	SCN 13-A	AB Noise	20t Excavators	109.0	5.0	0.0	100%	116.0	73.5	94.2	102.9	105.5	110.8	111.8	107.1	101.8	94.6
				SCN 13-B	AB Noise	Truck And Dog	107.0	3.0	0.0	50%	108.8	64.5	89.9	94.2	100.6	103.9	101.2	103.2	92.2	85.4
				SCN 13-C	AB Noise	Ventilation System (50 Inch Blowers / Extraction Fans	95.0	3.0	0.0	100%	99.8	64.9	81.4	96.6	90.3	93.7	89.6	84.7	77.1	71.5
				SCN 13-D	AB Noise	10t/S Water Treatment Plant	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 13-E	AB Noise	2 Inch Dewatering Pumps	91.0	10.0	0.0	100%	101.0	60.5	76.5	84.7	86.2	93.0	98.4	93.6	86.9	80.4
				SCN 13-F	AB Noise	Sucker Truck	116.0	1.0	5.0	100%	121.0	78.7	99.9	109.0	110.5	113.9	116.1	115.3	106.1	101.0
				SCN 13-G	AB Noise	Telehandlers	113.0	2.0	0.0	100%	116.0	77.2	88.4	104.5	109.7	108.5	109.7	109.7	101.3	97.2
Apr 2019 - Sept 2019	**Day and Night Works**	**Metro Box**	**Excavation to underside of Metro Concourse**	**SCN 13**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**119.1**	**-**	**-**	**-**	**123.5**	**82.1**	**101.7**	**111.4**	**114.1**	**116.8**	**118.6**	**117.2**	**108.7**	**103.4**
Sept 2019 - Dec 2022	Day and Night Works	Metro Box	Ongoing Logistical support of Box Construction	SCN 14-A	AB Noise	10t/S Water Treatment Plant	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 14-B	AB Noise	2 Inch Dewatering Pumps	91.0	10.0	0.0	100%	101.0	60.5	76.5	84.7	86.2	93.0	98.4	93.6	86.9	80.4
				SCN 14-C	AB Noise	Sucker Truck	116.0	3.0	5.0	100%	125.8	83.5	104.7	113.8	115.3	118.7	120.9	120.1	110.9	105.8
				SCN 14-D	AB Noise	Telehandlers	113.0	2.0	0.0	100%	116.0	77.2	88.4	104.5	109.7	108.5	109.7	109.7	101.3	97.2
				SCN 14-E	AB Noise	Ventilation System (50 Inch Blowers / Extraction Fans	95.0	3.0	0.0	100%	99.8	64.9	81.4	96.6	90.3	93.7	89.6	84.7	77.1	71.5
				SCN 14-F	AB Noise	160t Crawler Cranes	104.0	3.0	0.0	50%	105.8	68.2	79.3	88.9	91.1	98.8	98.8	94.7	102.1	91.7
				SCN 14-G	AB Noise	Concrete Trucks	112.0	3.0	0.0	100%	116.8	85.9	93.9	102.0	104.4	109.7	112.4	110.9	105.1	99.8
				SCN 14-H	AB Noise	Line Pumps	109.0	2.0	0.0	100%	112.0	71.5	87.5	95.7	97.2	104.0	109.4	104.6	97.9	91.4
				SCN 14-I	AB Noise	Rubbish Trucks	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
				SCN 14-J	AB Noise	Flat Bed Delivery Trucks	107.0	3.0	0.0	50%	108.8	64.5	89.9	94.2	100.6	103.9	101.2	103.2	92.2	85.4
				SCN 14-K	AB Noise	Truck And Dogs	107.0	3.0	0.0	50%	108.8	64.5	89.9	94.2	100.6	103.9	101.2	103.2	92.2	85.4
				SCN 14-L	AB Noise	60t Roughie Crane	104.0	1.0	5.0	50%	106.0	68.4	79.5	89.1	91.3	99.0	99.0	94.9	102.3	91.9
				SCN 14-M	AB Noise	Small Tools (Hammers, Drills, Rattle Guns Etc)	102.0	2.0	0.0	100%	105.0	61.7	85.4	90.5	90.2	100.8	100.9	96.2	84.5	74.4
				SCN 14-N	AB Noise	Site Accommodation Facilities	90.0	1.0	0.0	100%	90.0	63.7	72.9	79.0	81.5	83.9	83.1	84.3	75.1	69.0
				SCN 14-O	AB Noise	Lighting Towers	80.0	10.0	0.0	100%	90.0	63.7	72.9	79.0	81.5	83.9	83.1	84.3	75.1	69.0
				SCN 14-P	AB Noise / GB Vibration / GB Noise	Ongoing Works Below The Top Slab	114.6	1.0	0.0	100%	114.6	73.6	92.7	101.1	102.6	111.7	108.5	104.4	99.3	92.6
Sept 2019 - Dec 2022	**Day and Night Works**	**Metro Box**	**Ongoing Logistical support of Box Construction**	**SCN 14**	**AB Noise / GB Vibration / GB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**121.5**	**-**	**-**	**-**	**127.4**	**88.7**	**105.9**	**115.1**	**117.2**	**120.8**	**122.5**	**121.4**	**113.5**	**107.9**
Jun 2018 - Feb 2019	5 x WE Possessions (Daytime Only)	Central Walk	Site investigation Works (Tracks 16- 23)	SCN 15-A	AB Noise	Hi Rail Vac Tuck	107.0	2.0	5.0	100%	115.0	77.8	94.3	95.0	95.4	100.6	114.2	104.2	98.6	89.6
				SCN 15-B	AB Noise	6t Excavator	95.0	2.0	0.0	100%	98.0	55.5	76.2	84.9	87.5	92.8	93.8	89.1	83.8	76.6
Jun 2018 - Feb 2019	**5 x WE Possessions (Daytime Only)**	**Central Walk**	**Site investigation Works (Tracks 16- 23)**	**SCN 15**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**107.3**	**-**	**-**	**-**	**115.1**	**77.8**	**94.3**	**95.4**	**96.0**	**101.2**	**114.2**	**104.4**	**98.8**	**89.8**
Jul 2018 - Dec 2018	Weekend Possessions and Week Night Works / 24 hours once project EPL in place. Behind Hoarding	Central Walk	Construction of Olympic Stairs (Temp) - Platform 20/21 and 22/23	SCN 16A-A	AB Noise	Piling Rig (Auger)	110.0	2.0	5.0	100%	118.0	71.0	85.7	107.5	108.8	109.9	113.5	111.9	102.8	96.0
				SCN 16A-B	AB Noise	Electric Pallet Truck	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
				SCN 16A-C	AB Noise	Hi Rail Flat Bed	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
				SCN 16A-D	AB Noise	10t Forklift	106.0	1.0	0.0	50%	103.0	74.9	80.9	86.9	93.9	95.9	97.9	96.9	90.9	86.9
				SCN 16A-E	AB Noise	100 KVA Generator	99.0	2.0	0.0	100%	102.0	67.9	90.1	94.4	90.4	95.7	94.2	95.2	90.8	81.6
Jul 2018 - Dec 2018	**Weekend Possessions and Week Night Works / 24 hours once project EPL in place. Behind Hoarding**	**Central Walk**	**Construction of Olympic Stairs (Temp) - Platform 20/21 and 22/23**	**SCN 16A**	**AB Noise**	**TOTAL EMISSION (LW, 15minute in dBA)**	**113.9**	**-**	**-**	**-**	**118.9**	**77.3**	**94.5**	**108.0**	**109.8**	**111.4**	**114.0**	**112.8**	**103.7**	**97.1**
Jul 2018 - Dec 2018	Weekend Possessions and Week Night Works / 24 hours once project EPL in place. Behind Hoarding	Central Walk	Construction of Olympic Stairs (Temp) - Platform 20/21 and 22/23	SCN 16B-A	AB Noise	Piling Rig (Auger)	110.0	2.0	5.0	100%	118.0	71.0	85.7	107.5	108.8	109.9	113.5	111.9	102.8	96.0
				SCN 16B-B	AB Noise	Concrete Saw	117.0	1.0	5.0	50%	119.0	71.9	86.6	110.7	109.7	110.7	114.2	112.5	103.4	96.8
				SCN 16B-C	AB Noise	Concrete Coring Drill	117.0	1.0	5.0	50%	119.0	71.9	86.6	110.7	109.7	110.7	114.2	112.5	103.4	96.8
				SCN 16B-D	AB Noise	100 KVA Generator	99.0	2.0	0.0	100%	102.0	67.9	90.1	94.4	90.4	95.7	94.2	95.2	90.8	81.6
				SCN 16B-E	AB Noise	Electric Pallet Truck	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
				SCN 16B-F	AB Noise	Hi Rail Flat Bed	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
				SCN 16B-G	AB Noise	10t Forklift	106.0	1.0	0.0	50%	103.0	74.9	80.9	86.9	93.9	95.9	97.9	96.9	90.9	86.9
Jul 2018 - Dec 2018	**Weekend Possessions and Week Night Works / 24 hours once project EPL in place. Behind Hoarding**	**Central Walk**	**Construction of Olympic Stairs (Temp) - Platform 20/21 and 22/23**	**SCN 16B**	**AB Noise**	**TOTAL EMISSION (LW, 15minute in dBA)**	**121.0**	**-**	**-**	**-**	**123.7**	**79.3**	**95.7**	**114.8**	**114.5**	**115.7**	**118.9**	**117.4**	**108.3**	**101.7**
Jul 2018 - Dec 2018	Weekend Possessions and Week Night Works / 24 hours once project EPL in place. Behind Hoarding	Central Walk	Construction of Olympic Stairs (Temp) - Platform 20/21 and 22/23	SCN 16C-A	AB Noise / GB Vibration / GB Noise	5t Brokk (Rock Breaking)	118.0	2.0	5.0	50%	123.0	82.4	101.1	109.3	109.9	120.8	115.7	111.9	107.1	100.6
				SCN 16C-B	AB Noise	100 KVA Generator	99.0	2.0	0.0	100%	102.0	67.9	90.1	94.4	90.4	95.7	94.2	95.2	90.8	81.6
				SCN 16C-C	AB Noise	Electric Pallet Truck	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
				SCN 16C-D	AB Noise	4t Electric Hoist	100.0	2.0	0.0	50%	100.0	73.7	82.9	89.0	91.5	93.9	93.1	94.3	85.1	79.0
				SCN 16C-E	AB Noise	Hi Rail Flat Bed	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
				SCN 16C-F	AB Noise	10t Forklift	106.0	1.0	0.0	50%	103.0	74.9	80.9	86.9	93.9	95.9	97.9	96.9	90.9	86.9
Jul 2018 - Dec 2018	**Weekend Possessions and Week Night Works / 24 hours once project EPL in place. Behind Hoarding**	**Central Walk**	**Construction of Olympic Stairs (Temp) - Platform 20/21 and 22/23**	**SCN 16C**	**AB Noise / GB Vibration / GB Noise**	**TOTAL EMISSION (LW, 15minute in dBA)**	**119.0**	**-**	**-**	**-**	**123.3**	**83.8**	**101.9**	**109.7**	**110.7**	**121.0**	**116.0**	**112.9**	**107.5**	**101.0**

Proposed Timeframe	Timing Details	Area of Works	Activity	Assessment Scenario ID	Potential Impacts	Equipment	LW, Actual	Quantity	Penalty	Duty Factor	LW, Modified (Q + P / DF)	Spectral Data - dBA per 1/1 Octave - Frequency in Hertz (Hz)								
												31.5	63	125	250	500	1000	2000	4000	8000
Jul 2018 - Dec 2018	Weekend Possessions and Week Night Works / 24 hours once project EPL in place. Behind Hoarding	Central Walk	Construction of Olympic Stairs (Temp) - Platform 20/21 and 22/23	SCN 16D-A	AB Noise	Hi Rail Concrete Agitator	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 16D-B	AB Noise	100 KVA Generator	99.0	2.0	0.0	100%	102.0	67.9	90.1	94.4	90.4	95.7	94.2	95.2	90.8	81.6
				SCN 16D-C	AB Noise	4t Electric Hoist	100.0	2.0	0.0	50%	100.0	73.7	82.9	89.0	91.5	93.9	93.1	94.3	85.1	79.0
				SCN 16D-D	AB Noise	Concrete Pump	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 16D-E	AB Noise	Concrete Agitator	112.0	1.0	0.0	100%	112.0	81.1	89.1	97.2	99.6	104.9	107.6	106.1	100.3	95.0
				SCN 16D-F	AB Noise	Shotcrete Machine	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 16D-G	AB Noise	Electric Grout Mixer	102.0	1.0	0.0	100%	102.0	58.7	82.4	87.5	87.2	97.8	97.9	93.2	81.5	71.4
				SCN 16D-H	AB Noise	10t Forklift	106.0	1.0	0.0	50%	103.0	74.9	80.9	86.9	93.9	95.9	97.9	96.9	90.9	86.9
				SCN 16D-I	AB Noise / GB Vibration / GB Noise	5t Brokk (Rock Breaking)	118.0	1.0	5.0	50%	120.0	79.4	98.1	106.3	106.9	117.8	112.7	108.9	104.1	97.6
Jul 2018 - Dec 2018	**Weekend Possessions and Week Night Works / 24 hours once project EPL in place. Behind Hoarding**	**Central Walk**	**Construction of Olympic Stairs (Temp) - Platform 20/21 and 22/23**	**SCN 16D**	**AB Noise / GB Vibration / GB Noise**	**TOTAL EMISSION (LW, 15minute in dBA)**	**120.4**	-	-	-	**121.6**	**84.8**	**99.9**	**107.7**	**108.5**	**118.4**	**115.9**	**112.4**	**106.9**	**100.7**
Jan 2019 - May 2019	Week Night Works, behind hoarding	Central Walk	Construction of the new Standby Guards Rooms / demolition of existing standby guards rooms	SCN 17-A	AB Noise	Hi Rail Flat Bed	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
				SCN 17-B	AB Noise	Hi Rail Crane 10t	104.0	2.0	0.0	50%	104.0	66.4	77.5	87.1	89.3	97.0	97.0	92.9	100.3	89.9
				SCN 17-C	AB Noise	Wire Saw Concrete Cutting Rig	117.0	2.0	5.0	50%	122.0	74.9	89.6	113.7	112.7	113.7	117.2	115.5	106.4	99.8
				SCN 17-D	AB Noise / GB Vibration / GB Noise	5t Excavator (Hydraulic Breaker)	118.0	2.0	5.0	100%	126.0	83.5	104.2	112.9	115.5	120.8	121.8	117.1	111.8	104.6
				SCN 17-E	AB Noise	10t Forklift	106.0	2.0	0.0	50%	106.0	77.9	83.9	89.9	96.9	98.9	100.9	99.9	93.9	89.9
				SCN 17-F	AB Noise	Electric Pallet Truck	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
Jan 2019 - May 2019	**Week Night Works, behind hoarding**	**Central Walk**	**Construction of the new Standby Guards Rooms / demolition of existing standby guards rooms**	**SCN 17**	**AB Noise / GB Vibration / GB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**121.1**	-	-	-	**127.6**	**85.1**	**104.6**	**116.4**	**117.5**	**121.7**	**123.2**	**119.6**	**113.2**	**106.1**
May 2019 - Oct 2021	Weekend and Weeknight Possessions + weekday works behind hoarding	Central Walk	Construction of Platform Canopy Support System to Platforms 16 to 23 and Excavation of Launch Chambers	SCN 18-A	AB Noise	Hi Rail Flat Bed	107.0	1.0	0.0	50%	104.0	59.7	85.1	89.4	95.8	99.1	96.4	98.4	87.4	80.6
				SCN 18-B	AB Noise	Hi Rail Crane 25t	104.0	1.0	0.0	50%	101.0	63.4	74.5	84.1	86.3	94.0	94.0	89.9	97.3	86.9
				SCN 18-C	AB Noise	Hi Rail Concrete Agitator	112.0	1.0	0.0	100%	112.0	71.5	87.5	95.7	97.2	104.0	109.4	104.6	97.9	91.4
				SCN 18-D	AB Noise	Concrete Pump	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 18-E	AB Noise	5t Electric Hoist	100.0	1.0	0.0	50%	97.0	70.7	79.9	86.0	88.5	90.9	90.1	91.3	82.1	76.0
				SCN 18-F	AB Noise	5t Excavator	95.0	2.0	0.0	100%	98.0	55.5	76.2	84.9	87.5	92.8	93.8	89.1	83.8	76.6
				SCN 18-G	AB Noise	Truck And Dogs	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
				SCN 18-H	AB Noise	Electric Pallet Truck	107.0	1.0	0.0	50%	104.0	59.7	85.1	89.4	95.8	99.1	96.4	98.4	87.4	80.6
				SCN 18-I	AB Noise	25t Mobile Crane	104.0	1.0	0.0	50%	101.0	63.4	74.5	84.1	86.3	94.0	94.0	89.9	97.3	86.9
				SCN 18-J	AB Noise	10t Forklift	106.0	1.0	0.0	100%	106.0	77.9	83.9	89.9	96.9	98.9	100.9	99.9	93.9	89.9
				SCN 18-K	AB Noise	Floor Saw	117.0	1.0	5.0	100%	122.0	74.9	89.6	113.7	112.7	113.7	117.2	115.5	106.4	99.8
				SCN 18-L	AB Noise / GB Vibration / GB Noise	5t Brokk (Rock Breaking)	118.0	1.0	5.0	100%	123.0	82.4	101.1	109.3	109.9	120.8	115.7	111.9	107.1	100.6
May 2019 - Oct 2021	**Weekend and Weeknight Possessions + weekday works behind hoarding**	**Central Walk**	**Construction of Platform Canopy Support System to Platforms 16 to 23 and Excavation of Launch Chambers**	**SCN 18**	**AB Noise / GB Vibration / GB Noise**	**TOTAL EMISSION (LW, 15minute in dBA)**	**122.1**	-	-	-	**126.0**	**84.9**	**102.2**	**115.2**	**114.9**	**121.8**	**120.3**	**117.8**	**110.8**	**104.1**
May2020 - Sept 2021	Weekend and Weeknight Possessions + weekday works behind hoarding	Central Walk	Platform works including works below the top slab	SCN 19-A	AB Noise	Hi Rail Flat Bed	107.0	1.0	0.0	50%	104.0	59.7	85.1	89.4	95.8	99.1	96.4	98.4	87.4	80.6
				SCN 19-B	AB Noise	Electric Pallet Truck	107.0	1.0	0.0	50%	104.0	59.7	85.1	89.4	95.8	99.1	96.4	98.4	87.4	80.6
				SCN 19-C	AB Noise	Scissor Lifts	90.0	2.0	0.0	50%	90.0	55.9	78.1	82.4	78.4	83.7	82.2	83.2	78.8	69.6
				SCN 19-D	AB Noise	Grout / Screed Pump	99.0	1.0	0.0	100%	99.0	64.9	87.1	91.4	87.4	92.7	91.2	92.2	87.8	78.6
				SCN 19-E	AB Noise	Concrete Agitator	112.0	1.0	0.0	100%	112.0	71.5	87.5	95.7	97.2	104.0	109.4	104.6	97.9	91.4
				SCN 19-F	AB Noise	Tower Crane	105.0	1.0	0.0	50%	102.0	61.4	80.1	88.3	88.9	99.8	94.7	90.9	86.1	79.6
				SCN 19-G	AB Noise	5t Electric Hoist In Lift Shafts	100.0	1.0	0.0	50%	97.0	70.7	79.9	86.0	88.5	90.9	90.1	91.3	82.1	76.0
				SCN 19-H	AB Noise / GB Vibration / GB Noise	Ongoing Works Below The Surface	109.0	1.0	0.0	100%	109.0	66.7	87.3	95.9	98.6	103.7	104.8	100.2	94.8	87.6
May2020 - Sept 2021	**Weekend and Weeknight Possessions + weekday works behind hoarding**	**Central Walk**	**Platform works including works below the top slab**	**SCN 19**	**AB Noise / GB Vibration / GB Noise**	**TOTAL EMISSION (LW, 15minute in dBA)**	**115.9**	-	-	-	**115.0**	**75.7**	**94.0**	**100.8**	**103.5**	**108.9**	**111.2**	**107.6**	**100.6**	**93.8**
Dec 2021 - Sept 2022	Weekend Possessions, Week Night Possessions	Central Walk	Platform Remodelling works including platform canopy modifications	SCN 20-A	AB Noise	Hi Rail Flat Bed	107.0	1.0	0.0	50%	104.0	59.7	85.1	89.4	95.8	99.1	96.4	98.4	87.4	80.6
				SCN 20-B	AB Noise	Electric Pallet Truck	107.0	1.0	0.0	50%	104.0	59.7	85.1	89.4	95.8	99.1	96.4	98.4	87.4	80.6
				SCN 20-C	AB Noise	Floor Saw	117.0	1.0	5.0	50%	119.0	71.9	86.6	110.7	109.7	110.7	114.2	112.5	103.4	96.8
				SCN 20-D	AB Noise / GB Vibration / GB Noise	5t Excavator (Hydraulic Breaker)	118.0	1.0	5.0	100%	123.0	82.4	101.1	109.3	109.9	120.8	115.7	111.9	107.1	100.6
				SCN 20-E	AB Noise	Scissor Lifts	90.0	2.0	0.0	50%	90.0	55.9	78.1	82.4	78.4	83.7	82.2	83.2	78.8	69.6
				SCN 20-F	AB Noise	Grout / Screed Pump	99.0	1.0	0.0	100%	99.0	64.9	87.1	91.4	87.4	92.7	91.2	92.2	87.8	78.6
				SCN 20-G	AB Noise	Concrete Agitator	112.0	1.0	0.0	100%	112.0	71.5	87.5	95.7	97.2	104.0	109.4	104.6	97.9	91.4
				SCN 20-H	AB Noise	Tower Crane	105.0	1.0	0.0	50%	102.0	61.4	80.1	88.3	88.9	99.8	94.7	90.9	86.1	79.6
				SCN 20-I	AB Noise	5t Electric Hoist In Lift Shafts	100.0	1.0	0.0	50%	97.0	70.7	79.9	86.0	88.5	90.9	90.1	91.3	82.1	76.0
Dec 2021 - Sept 2022	**Weekend Possessions, Week Night Possessions**	**Central Walk**	**Platform Remodelling works including platform canopy modifications**	**SCN 20**	**AB Noise / GB Vibration / GB Noise**	**TOTAL EMISSION (LW, 15minute in dBA)**	**121.6**	-	-	-	**124.8**	**83.5**	**101.9**	**113.3**	**113.1**	**121.4**	**118.6**	**115.8**	**109.1**	**102.6**
Oct 2018 - Jun 2019	Standard Construction Hours, behind hoarding	ESR	Construction of Shaft to ESR Ghost Platform	SCN 21-A	AB Noise	Floor Saw	117.0	1.0	5.0	50%	119.0	71.9	86.6	110.7	109.7	110.7	114.2	112.5	103.4	96.8
				SCN 21-B	AB Noise / GB Vibration	Sheet Piling Rig	121.0	1.0	5.0	30%	120.8	73.7	88.4	112.5	111.5	112.5	116.0	114.3	105.2	98.6
				SCN 21-C	AB Noise	10t Excavator	100.0	1.0	0.0	100%	100.0	57.5	78.2	86.9	89.5	94.8	95.8	91.1	85.8	78.6
				SCN 21-D	AB Noise	Truck And Dogs	107.0	1.0	0.0	50%	104.0	59.7	85.1	89.4	95.8	99.1	96.4	98.4	87.4	80.6
				SCN 21-E	AB Noise	Wire Saw Concrete Cutting Rig	117.0	1.0	5.0	100%	122.0	74.9	89.6	113.7	112.7	113.7	117.2	115.5	106.4	99.8
				SCN 21-F	AB Noise	Concrete Pump	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 21-G	AB Noise	Concrete Agitators	112.0	1.0	0.0	100%	112.0	71.5	87.5	95.7	97.2	104.0	109.4	104.6	97.9	91.4
				SCN 21-H	AB Noise	Scissor Lifts	90.0	1.0	0.0	50%	87.0	52.9	75.1	79.4	75.4	80.7	79.2	80.2	75.8	66.6
				SCN 21-I	AB Noise	10t Hoist	100.0	1.0	0.0	50%	97.0	70.7	79.9	86.0	88.5	90.9	90.1	91.3	82.1	76.0
Oct 2018 - Jun 2019	**Standard Construction Hours, behind hoarding**	**ESR**	**Construction of Shaft to ESR Ghost Platform**	**SCN 21**	**AB Noise / GB Vibration**	**TOTAL EMISSION (LW, 15minute in dBA)**	**124.1**	-	-	-	**125.9**	**80.2**	**95.3**	**117.3**	**116.4**	**117.6**	**121.2**	**119.3**	**110.4**	**103.8**
Oct 2018 - Dec 2020	Day Time Normal Hours and Weeknight Non operational Hours, behind hoarding	ESR	Surface Works and Underground works	SCN 22-A	AB Noise	Floor Saw	117.0	1.0	5.0	50%	119.0	71.9	86.6	110.7	109.7	110.7	114.2	112.5	103.4	96.8
				SCN 22-B	AB Noise	10t Excavator	100.0	1.0	0.0	100%	100.0	57.5	78.2	86.9	89.5	94.8	95.8	91.1	85.8	78.6
				SCN 22-C	AB Noise	Truck And Dogs	107.0	1.0	0.0	50%	104.0	59.7	85.1	89.4	95.8	99.1	96.4	98.4	87.4	80.6
				SCN 22-D	AB Noise	Wire Saw Concrete Cutting Rig	117.0	1.0	5.0	100%	122.0	74.9	89.6	113.7	112.7	113.7	117.2	115.5	106.4	99.8
				SCN 22-E	AB Noise	Concrete Pump	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 22-F	AB Noise	Concrete Agitators	112.0	1.0	0.0	100%	112.0	71.5	87.5	95.7	97.2	104.0	109.4	104.6	97.9	91.4
				SCN 22-G	AB Noise	Scissor Lifts	90.0	1.0	0.0	50%	87.0	52.9	75.1	79.4	75.4	80.7	79.2	80.2	75.8	66.6
				SCN 22-H	AB Noise	10t Hoist	100.0	1.0	0.0	50%	97.0	70.7	79.9	86.0	88.5	90.9	90.1	91.3	82.1	76.0
				SCN 22-I	AB Noise	Ongoing Works Below The Surface	103.8	1.0	0.0	100%	103.8	61.6	76.6	94.7	94.5	95.9	99.0	97.4	89.1	82.2
Oct 2018 - Dec 2020	**Day Time Normal Hours and Weeknight Non operational Hours, behind hoarding**	**ESR**	**Surface Works and Underground works**	**SCN 22**	**AB Noise / GB Vibration**	**TOTAL EMISSION (LW, 15minute in dBA)**	**121.3**	-	-	-	**124.3**	**79.2**	**94.4**	**115.6**	**114.7**	**116.0**	**119.7**	**117.7**	**108.9**	**102.3**
Oct 2018 - Aug 2019	Standard Construction Hours	East Entrance	Demolition of the Bounce Hotel	SCN 23-A	AB Noise	25t Mobile Crane	105.0	1.0	0.0	50%	102.0	61.4	80.1	88.3	88.9	99.8	94.7	90.9	86.1	79.6
				SCN 23-B	AB Noise	Flat Bed Rigid Delivery Trucks	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
				SCN 23-C	AB Noise	Truck And Dogs	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
				SCN 23-D	AB Noise	Wire Saw Concrete Cutting Rig	117.0	1.0	5.0	100%	122.0	74.9	89.6	113.7	112.7	113.7	117.2	115.5	106.4	99.8
				SCN 23-E	AB Noise / GB Vibration / GB Noise	5t Excavator (Hydraulic Breaker)	118.0	1.0	5.0	100%	123.0	82.4	101.1	109.3	109.9	120.8	115.7	111.9	107.1	100.6
				SCN 23-F	AB Noise / GB Vibration / GB Noise	10t Excavator (Hydraulic Breaker)	118.0	1.0	5.0	100%	123.0	82.4	101.1	109.3	109.9	120.8	115.7	111.9	107.1	100.6
				SCN 23-G	AB Noise	Road Sweeper	107.0	1.0	0.0	100%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
				SCN 23-H	AB Noise	Dust Suppression Plant	104.0	1.0	0.0	100%	104.0	69.9	92.1	96.4	92.4	97.7	96.2	97.2	92.8	83.6
Oct 2018 - Aug 2019	**Standard Construction Hours**	**East Entrance**	**Demolition of the Bounce Hotel**	**SCN 23**	**AB Noise / GB Vibration / GB Noise**	**TOTAL EMISSION (LW, 15minute in dBA)**	**122.9**	-	-	-	**127.6**	**86.0**	**104.9**	**116.2**	**116.1**	**124.3**	**121.1**	**118.5**	**111.8**	**105.3**

Proposed Timeframe	Timing Details	Area of Works	Activity	Assessment Scenario ID	Potential Impacts	Equipment	LW - Actual	Quantity	Penalty	Duty Factor	LW - Modified (Q / P / DF)	Spectral Data - dBA per 1/1 Octave - Frequency in Hertz (Hz)								
												31.5	63	125	250	500	1000	2000	4000	8000
Sept 2019 - Dec 2019	Standard Construction Hours	East Entrance	Piling for East Entrance	SCN 24-A	AB Noise	Piling Rig (Auger)	110.0	1.0	5.0	100%	115.0	68.0	82.7	104.5	105.8	106.9	110.5	108.9	99.8	93.0
				SCN 24-B	AB Noise	Flat Bed Rigid Delivery Trucks	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
				SCN 24-C	AB Noise	Concrete Agitator	112.0	1.0	0.0	100%	112.0	71.5	87.5	95.7	97.2	104.0	109.4	104.6	97.9	91.4
				SCN 24-D	AB Noise	Concrete Pump	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 24-E	AB Noise / GB Vibration / GB Noise	10t Excavator (Hydraulic Breaker)	118.0	1.0	5.0	100%	123.0	82.4	101.1	109.3	109.9	120.8	115.7	111.9	107.1	100.6
				SCN 24-F	AB Noise	Bob Cat	104.0	1.0	0.0	100%	104.0	51.7	73.9	83.0	89.5	99.9	100.1	95.3	87.1	85.0
				SCN 24-G	AB Noise	200cfm Compressor	100.0	1.0	0.0	100%	100.0	73.7	82.9	89.0	91.5	93.9	93.1	94.3	85.1	79.0
				SCN 24-H	AB Noise	Truck And Dogs	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
Sept 2019 - Dec 2019	**Standard Construction Hours**	**East Entrance**	**Piling for East Entrance**	**SCN 24**	**AB Noise / GB Vibration / GB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**120.4**	-	-	-	**124.3**	**83.6**	**101.9**	**110.9**	**112.1**	**121.3**	**118.1**	**114.9**	**108.6**	**102.1**
Dec 2019 - Apr 2020	Standard Construction Hours	East Entrance	Excavation of East Entrance	SCN 25-A	AB Noise	20t Excavator	105.0	1.0	0.0	100%	105.0	62.5	83.2	91.9	94.5	99.8	100.8	96.1	90.8	83.6
				SCN 25-B	AB Noise	Bob Cat	104.0	1.0	0.0	100%	104.0	51.7	73.9	83.0	89.5	99.9	100.1	95.3	87.1	85.0
				SCN 25-C	AB Noise	Truck And Dogs	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
				SCN 25-D	AB Noise	Drilling Rig For Ground Anchors	113.0	1.0	5.0	100%	118.0	71.0	85.7	107.5	108.8	109.9	113.5	111.9	102.8	96.0
				SCN 25-E	AB Noise	Shotcrete Machine	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 25-F	AB Noise	Concrete Agitator	112.0	1.0	0.0	100%	112.0	71.5	87.5	95.7	97.2	104.0	109.4	104.6	97.9	91.4
				SCN 25-G	AB Noise	Concrete Pump	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 25-H	AB Noise	200kva Generator (Diesel)	99.0	1.0	0.0	100%	99.0	64.9	87.1	91.4	87.4	92.7	91.2	92.2	87.8	78.6
				SCN 25-I	AB Noise	Water Pump (4 Inch)	91.0	1.0	0.0	100%	91.0	50.5	66.5	74.7	76.2	83.0	88.4	83.6	76.9	70.4
				SCN 25-J	AB Noise	200 CFM Compressor	100.0	1.0	0.0	100%	100.0	73.7	82.9	89.0	91.5	93.9	93.1	94.3	85.1	79.0
Dec 2019 - Apr 2020	**Standard Construction Hours**	**East Entrance**	**Excavation of East Entrance**	**SCN 25**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**118.1**	-	-	-	**120.3**	**78.5**	**94.9**	**108.4**	**110.0**	**112.7**	**116.4**	**113.8**	**105.5**	**98.9**
Dec 2019 - Apr 2020	Standard Construction Hours	East Entrance	Excavation of Adit to ESR Concourse including Canopy Tube installation	SCN 26-A	AB Noise	Canopy Tube Boring Machines (Horizontal)	110.0	1.0	5.0	100%	115.0	68.0	82.7	104.5	105.8	106.9	110.5	108.9	99.8	93.0
				SCN 26-B	AB Noise	Hi Rail Flat Bed Trucks	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
				SCN 26-C	AB Noise	Hi Rail Concrete Agitator	112.0	1.0	0.0	100%	112.0	71.5	87.5	95.7	97.2	104.0	109.4	104.6	97.9	91.4
				SCN 26-D	AB Noise	Concrete Pump	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 26-E	AB Noise	25t Crane	105.0	1.0	0.0	50%	102.0	61.4	80.1	88.3	88.9	99.8	94.7	90.9	86.1	79.6
				SCN 26-F	AB Noise	Truck And Dogs	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
				SCN 26-G	AB Noise	Arc Welding Machine	105.0	1.0	0.0	100%	105.0	70.9	93.1	97.4	93.4	98.7	97.2	98.2	93.8	84.6
				SCN 26-H	AB Noise	Drilling Rig	113.0	1.0	5.0	100%	118.0	71.0	85.7	107.5	108.8	109.9	113.5	111.9	102.8	96.0
				SCN 26-I	AB Noise	Ventilation Fans (1m Dia)	95.0	2.0	0.0	100%	98.0	63.2	79.7	94.9	88.6	92.0	87.9	83.0	75.4	69.8
				SCN 26-J	AB Noise	Water Pump (4 Inch)	91.0	1.0	0.0	100%	91.0	50.5	66.5	74.7	76.2	83.0	88.4	83.6	76.9	70.4
Dec 2019 - Apr 2020	**Standard Construction Hours**	**East Entrance**	**Excavation of Adit to ESR Concourse including Canopy Tube installation**	**SCN 26**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**118.5**	-	-	-	**121.3**	**77.8**	**96.9**	**110.1**	**111.5**	**113.7**	**116.9**	**114.9**	**106.3**	**99.5**
May 2020 - Jan 2021	Standard Construction Hours	East Entrance	FRP works to East Entrance	SCN 27-A	AB Noise	Tower Crane	105.0	1.0	0.0	50%	102.0	61.4	80.1	88.3	88.9	99.8	94.7	90.9	86.1	79.6
				SCN 27-B	AB Noise	Arc Welding Machines	105.0	2.0	0.0	100%	108.0	73.9	96.1	100.4	96.4	101.7	100.2	101.2	96.8	87.6
				SCN 27-C	AB Noise	Waterproof Welding Machine	105.0	1.0	0.0	100%	105.0	70.9	93.1	97.4	93.4	98.7	97.2	98.2	93.8	84.6
				SCN 27-D	AB Noise	Concrete Pump	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 27-E	AB Noise	Concrete Agitator	112.0	1.0	0.0	100%	112.0	71.5	87.5	95.7	97.2	104.0	109.4	104.6	97.9	91.4
				SCN 27-F	AB Noise	Concrete Skip	99.0	2.0	0.0	100%	102.0	67.9	90.1	94.4	90.4	95.7	94.2	95.2	90.8	81.6
				SCN 27-G	AB Noise	All Terrain Scissor Lifts	90.0	2.0	0.0	50%	90.0	55.9	78.1	82.4	78.4	83.7	82.2	83.2	78.8	69.6
				SCN 27-H	AB Noise	Flat Bed Rigid Delivery Trucks	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
May 2020 - Jan 2021	**Standard Construction Hours**	**East Entrance**	**FRP works to East Entrance**	**SCN 27**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**115.9**	-	-	-	**116.2**	**78.3**	**99.5**	**104.4**	**103.8**	**109.5**	**112.1**	**109.1**	**102.8**	**95.3**
May 2020 - Jul 2021	Standard Construction Hours	East Entrance	East Entrance Works and Underground Works	SCN 28-A	AB Noise	Tower Crane	105.0	1.0	0.0	50%	102.0	61.4	80.1	88.3	88.9	99.8	94.7	90.9	86.1	79.6
				SCN 28-B	AB Noise	Arc Welding Machines	105.0	2.0	0.0	100%	108.0	73.9	96.1	100.4	96.4	101.7	100.2	101.2	96.8	87.6
				SCN 28-C	AB Noise	Waterproof Welding Machine	105.0	1.0	0.0	100%	105.0	70.9	93.1	97.4	93.4	98.7	97.2	98.2	93.8	84.6
				SCN 28-D	AB Noise	Concrete Pump	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 28-E	AB Noise	Concrete Agitator	112.0	1.0	0.0	100%	112.0	71.5	87.5	95.7	97.2	104.0	109.4	104.6	97.9	91.4
				SCN 28-F	AB Noise	Concrete Skip	99.0	2.0	0.0	100%	102.0	67.9	90.1	94.4	90.4	95.7	94.2	95.2	90.8	81.6
				SCN 28-G	AB Noise	All Terrain Scissor Lifts	90.0	2.0	0.0	50%	90.0	55.9	78.1	82.4	78.4	83.7	82.2	83.2	78.8	69.6
				SCN 28-H	AB Noise	Flat Bed Rigid Delivery Trucks	107.0	2.0	0.0	50%	107.0	62.7	88.1	92.4	98.8	102.1	99.4	101.4	90.4	83.6
				SCN 28-I	AB Noise	Ongoing Works Below The Surface	91.9	1.0	0.0	100%	91.9	53.2	73.2	79.6	83.3	87.3	84.3	85.8	75.5	68.7
May 2020 - Jul 2021	**Standard Construction Hours**	**East Entrance**	**East Entrance Works and Underground Works**	**SCN 28**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**115.9**	-	-	-	**116.2**	**78.3**	**99.5**	**104.4**	**103.8**	**109.5**	**112.1**	**109.1**	**102.8**	**95.3**
Aug 2019 - Sep 2019	Nights between hours 10pm to 4am	Grand Concourse	Piling in Grand Concourse	SCN 29-A	AB Noise	Soilmec 75	113.0	1.0	5.0	100%	118.0	71.0	85.7	107.5	108.8	109.9	113.5	111.9	102.8	96.0
				SCN 29-B	AB Noise	8t Excavator	95.0	1.0	0.0	100%	95.0	52.5	73.2	81.9	84.5	89.8	90.8	86.1	80.8	73.6
				SCN 29-C	AB Noise	Demo Saw	117.0	1.0	5.0	100%	122.0	74.9	89.6	113.7	112.7	113.7	117.2	115.5	106.4	99.8
				SCN 29-D	AB Noise / GB Vibration	Jackhammer	113.0	1.0	5.0	100%	118.0	79.1	93.9	106.6	109.3	110.8	112.7	111.8	104.9	97.2
				SCN 29-E	AB Noise	Concrete Line Pump	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 29-F	AB Noise	Trucks For Spoil	107.0	1.0	0.0	50%	104.0	59.7	85.1	89.4	95.8	99.1	96.4	98.4	87.4	80.6
				SCN 29-G	AB Noise	Sucker Truck	116.0	1.0	5.0	100%	121.0	78.7	99.9	109.0	110.5	113.9	116.1	115.3	106.1	101.0
				SCN 29-H	AB Noise	Concrete Agitator	112.0	1.0	0.0	100%	112.0	71.5	87.5	95.7	97.2	104.0	109.4	104.6	97.9	91.4
				SCN 29-I	AB Noise	Lighting Tower	80.0	1.0	0.0	100%	80.0	53.7	62.9	69.0	71.5	73.9	73.1	74.3	65.1	59.0
				SCN 29-J	AB Noise	Small Tools	102.0	1.0	0.0	100%	102.0	58.7	82.4	87.5	87.2	97.8	97.9	93.2	81.5	71.4
				SCN 29-K	AB Noise	Delivery Trucks	107.0	1.0	0.0	50%	104.0	57.0	76.2	88.3	96.8	98.2	99.4	95.6	88.4	75.3
Aug 2019 - Sep 2019	**Nights between hours 10pm to 4am**	**Grand Concourse**	**Piling in Grand Concourse**	**SCN 29**	**AB Noise / GB Vibration**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**122.2**	-	-	-	**126.4**	**83.5**	**101.8**	**116.3**	**116.8**	**118.8**	**121.7**	**120.3**	**111.6**	**105.3**
Aug 2019 - Sep 2019	Nights between hours 10pm to 4am	Grand Concourse	FRP Pile caps	SCN 30-A	AB Noise	8t Excavator	95.0	1.0	0.0	100%	95.0	52.5	73.2	81.9	84.5	89.8	90.8	86.1	80.8	73.6
				SCN 30-B	AB Noise / GB Vibration	Jackhammer	113.0	2.0	5.0	100%	121.0	82.1	96.9	109.6	112.3	113.8	115.7	114.8	107.9	100.2
				SCN 30-C	AB Noise	Welding Machine	105.0	1.0	0.0	100%	105.0	70.9	93.1	97.4	93.4	98.7	97.2	98.2	93.8	84.6
				SCN 30-D	AB Noise	Concrete Agitator	112.0	2.0	0.0	100%	115.0	74.5	90.5	98.7	100.2	107.0	112.4	107.6	100.9	94.4
				SCN 30-E	AB Noise	20m Concrete Line Pump	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 30-F	AB Noise	Hand Held Vibrators	113.0	2.0	5.0	100%	121.0	70.4	88.6	103.7	114.2	114.6	115.8	114.0	105.8	99.7
				SCN 30-G	AB Noise	Hand Held Masonry Drills	102.0	3.0	0.0	100%	106.8	62.5	87.9	92.2	98.6	101.9	99.2	101.2	90.2	83.4
				SCN 30-H	AB Noise	Truck For Deliveries	107.0	1.0	0.0	50%	104.0	57.0	76.2	88.3	96.8	98.2	99.4	95.6	88.4	75.3
				SCN 30-I	AB Noise	6 Inch Circular Saw	117.0	4.0	5.0	100%	128.0	83.7	109.1	113.4	119.8	123.1	120.4	122.4	111.4	104.6
				SCN 30-J	AB Noise	130 CFM Compressor	100.0	1.0	0.0	100%	100.0	73.7	82.9	89.0	91.5	93.9	93.1	94.3	85.1	79.0
				SCN 30-K	AB Noise	Explosive Nail Guns	116.0	2.0	5.0	100%	124.0	85.1	99.9	112.6	115.3	116.8	118.7	117.8	110.9	103.2
				SCN 30-L	AB Noise	Lighting Tower	80.0	1.0	0.0	100%	80.0	53.7	62.9	69.0	71.5	73.9	73.1	74.3	65.1	59.0
				SCN 30-M	AB Noise	Small Tools (Hammers, Drills Etc)	102.0	2.0	0.0	100%	105.0	60.7	86.1	90.4	96.8	100.1	97.4	99.4	88.4	81.6
Aug 2019 - Sep 2019	**Nights between hours 10pm to 4am**	**Grand Concourse**	**FRP Pile caps**	**SCN 30**	**AB Noise / GB Vibration**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**122.2**	-	-	-	**130.8**	**89.1**	**110.1**	**117.3**	**122.5**	**125.0**	**124.6**	**124.8**	**115.8**	**108.7**
Sept 2019 - Oct 2019	Nights between hours 10pm to 4am	Grand Concourse	Removal of Existing Canopies	SCN 31-A	AB Noise	Oxy Sets	105.0	3.0	0.0	100%	109.8	67.3	88.0	96.7	99.3	104.6	105.6	100.9	95.6	88.4
				SCN 31-B	AB Noise	Cherry Pickers	105.0	3.0	0.0	50%	106.8	72.7	94.9	99.2	95.2	100.5	99.0	100.0	95.6	86.4
				SCN 31-C	AB Noise	30t Crawler Crane / Spider Crane	104.0	1.0	0.0	50%	101.0	63.4	74.5	84.1	86.3	94.0	94.0	89.9	97.3	86.9
				SCN 31-D	AB Noise	Scissor Lift	90.0	1.0	0.0	50%	87.0	44.5	65.2	73.9	76.5	81.8	82.8	78.1	72.8	65.6
				SCN 31-E	AB Noise	Lighting Tower	80.0	1.0	0.0	100%	80.0	53.7	62.9	69.0	71.5	73.9	73.1	74.3	65.1	59.0
				SCN 31-F	AB Noise	Trucks	107.0	2.0	0.0	50%	107.0	60.0	79.2	91.3	99.8	101.2	102.4	98.6	91.4	78.3
Sept 2019 - Oct 2019	**Nights between hours 10pm to 4am**	**Grand Concourse**	**Removal of Existing Canopies**	**SCN 31**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**111.4**	-	-	-	**113.1**	**74.4**	**95.9**	**101.7**	**103.4**	**107.4**	**108.1**	**104.9**	**101.5**	**92.3**

Proposed Timeframe	Timing Details	Area of Works	Activity	Assessment Scenario ID	Potential Impacts	Equipment	LW, Actual	Quantity	Penalty	Duty Factor	LW, Modified (Q / P / DF)	Spectral Data - dBA per 1/1 Octave - Frequency in Hertz (Hz)								
												31.5	63	125	250	500	1000	2000	4000	80000
Nov 2019 - Jan 2020	Nights between hours 10pm to 4am	Grand Concourse	Installation of precast / insitu columns and arches	SCN 32-A	AB Noise	8t Excavator	95.0	1.0	0.0	100%	95.0	52.5	73.2	81.9	84.5	89.8	90.8	86.1	80.8	73.6
				SCN 32-B	AB Noise / GB Vibration	Jackhammer	113.0	2.0	5.0	100%	121.0	82.1	96.9	109.6	112.3	113.8	115.7	114.8	107.9	100.2
				SCN 32-C	AB Noise	Welding Machine	105.0	1.0	0.0	100%	105.0	70.9	93.1	97.4	93.4	98.7	97.2	98.2	93.8	84.6
				SCN 32-D	AB Noise	Concrete Agitator	112.0	2.0	0.0	100%	115.0	74.5	90.5	98.7	100.2	107.0	112.4	107.6	100.9	94.4
				SCN 32-E	AB Noise	20m Concrete Line Pump	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 32-F	AB Noise	Hand Held Vibrators	113.0	2.0	5.0	100%	121.0	70.4	88.6	103.7	114.2	114.6	115.8	114.0	105.8	99.7
				SCN 32-G	AB Noise	Hand Held Masonry Drills	102.0	3.0	0.0	100%	106.8	62.5	87.9	92.2	98.6	101.9	99.2	101.2	90.2	83.4
				SCN 32-H	AB Noise	Truck For Deliveries	107.0	1.0	0.0	50%	104.0	57.0	76.2	88.3	96.8	98.2	99.4	95.6	88.4	75.3
				SCN 32-I	AB Noise	6 Inch Circular Saw	117.0	4.0	5.0	100%	128.0	83.7	109.1	113.4	119.8	123.1	120.4	122.4	111.4	104.6
				SCN 32-J	AB Noise	130 CFM Compressor	100.0	1.0	0.0	100%	100.0	73.7	82.9	89.0	91.5	93.9	93.1	94.3	85.1	79.0
				SCN 32-K	AB Noise	Explosive Nail Guns	116.0	2.0	5.0	100%	124.0	85.1	99.9	112.6	115.3	116.8	118.7	117.8	110.9	103.2
				SCN 32-L	AB Noise	Lighting Tower	80.0	1.0	0.0	100%	80.0	53.7	62.9	69.0	71.5	73.9	73.1	74.3	65.1	59.0
Nov 2019 - Jan 2020	**Nights between hours 10pm to 4am**	**Grand Concourse**	**Installation of precast / insitu columns and arches**	**SCN 32**	**AB Noise / GB Vibration**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**122.2**	**-**	**-**	**-**	**130.8**	**89.0**	**110.1**	**117.3**	**122.5**	**125.0**	**124.5**	**124.8**	**115.8**	**108.7**
Jul 2020 - Aug 2021	Nights between hours 10pm to 4am	Grand Concourse	Installation of Roof Structure	SCN 33-A	AB Noise	Elevated Work Platform (EWP)	105.0	3.0	0.0	50%	106.8	72.7	94.9	99.2	95.2	100.5	99.0	100.0	95.6	86.4
				SCN 33-B	AB Noise	120t Crawler	104.0	1.0	0.0	50%	101.0	63.4	74.5	84.1	86.3	94.0	94.0	89.9	97.3	86.9
				SCN 33-C	AB Noise	Delivery Trucks	107.0	1.0	0.0	50%	104.0	57.0	76.2	88.3	96.8	98.2	99.4	95.6	88.4	75.3
				SCN 33-D	AB Noise	Small Tools (Hammers, Drills Etc)	102.0	2.0	0.0	100%	105.0	60.7	86.1	90.4	96.8	100.1	97.4	99.4	88.4	81.6
				SCN 33-E	AB Noise	130 CFM Compressor	100.0	1.0	0.0	100%	100.0	73.7	82.9	89.0	91.5	93.9	93.1	94.3	85.1	79.0
				SCN 33-F	AB Noise	Lighting Tower	80.0	3.0	0.0	100%	84.8	58.5	67.7	73.8	76.3	78.7	77.9	79.1	69.9	63.8
Jul 2020 - Aug 2021	**Nights between hours 10pm to 4am**	**Grand Concourse**	**Installation of Roof Structure**	**SCN 33**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**111.2**	**-**	**-**	**-**	**111.0**	**76.7**	**95.8**	**100.5**	**101.7**	**105.2**	**104.3**	**104.2**	**100.3**	**90.8**
Mar 2020 - May 2020	Standard Construction Hours	Northern Concourse & North Entry	Demolition Southern Half	SCN 34-A	AB Noise	20t Excavator With Muncher	105.0	1.0	5.0	100%	110.0	67.5	88.2	96.9	99.5	104.8	105.8	101.1	95.8	88.6
				SCN 34-B	AB Noise	Demo Saws	117.0	2.0	5.0	100%	125.0	80.7	106.1	110.4	116.8	120.1	117.4	119.4	108.4	101.6
				SCN 34-C	AB Noise / GB Vibration	Jackhammer	113.0	4.0	5.0	100%	124.0	85.1	99.9	112.6	115.3	116.8	118.7	117.8	110.9	103.2
				SCN 34-D	AB Noise	Oxy Sets	105.0	3.0	0.0	100%	109.8	75.7	97.9	102.2	98.2	103.5	102.0	103.0	98.6	89.4
				SCN 34-E	AB Noise	Trucks	107.0	3.0	0.0	50%	108.8	61.8	81.0	93.1	101.6	103.0	104.2	100.4	93.2	80.1
				SCN 34-F	AB Noise	130 CFM Compressor	100.0	1.0	0.0	100%	100.0	73.7	82.9	89.0	91.5	93.9	93.1	94.3	85.1	79.0
				SCN 34-G	AB Noise	Small Tools (Hammers, Drills Etc)	102.0	2.0	0.0	100%	105.0	60.7	86.1	90.4	96.8	100.1	97.4	99.4	88.4	81.6
				SCN 34-H	AB Noise	Elevated Work Platform (EWP)	105.0	1.0	0.0	50%	102.0	67.9	90.1	94.4	90.4	95.7	94.2	95.2	90.8	81.6
Mar 2020 - May 2020	**Standard Construction Hours**	**Northern Concourse & North Entry**	**Demolition Southern Half**	**SCN 34**	**AB Noise / GB Vibration**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**119.4**	**-**	**-**	**-**	**127.8**	**87.1**	**107.7**	**115.0**	**119.3**	**122.0**	**121.4**	**121.9**	**113.2**	**105.7**
Jun 2020 - Aug 2020	Standard Construction Hours	Northern Concourse & North Entry	FRP of Structure (Floor, retaining wall, Columns)	SCN 35-A	AB Noise	Hand Held Vibrators	113.0	2.0	5.0	100%	121.0	74.0	88.7	110.5	111.8	112.9	116.5	114.9	105.8	99.0
				SCN 35-B	AB Noise	Hand Held Masonry Drills	102.0	3.0	0.0	100%	106.8	64.3	85.0	93.7	96.3	101.6	102.6	97.9	92.6	85.4
				SCN 35-C	AB Noise	Delivery Trucks	107.0	2.0	0.0	50%	107.0	59.9	74.6	98.7	97.7	98.7	102.2	100.5	91.4	84.8
				SCN 35-D	AB Noise	6 Inch Circular Saw	117.0	4.0	5.0	100%	128.0	89.1	103.9	116.6	119.3	120.8	122.7	121.8	114.9	107.2
				SCN 35-E	AB Noise	130 CFM Compressor	100.0	1.0	0.0	100%	100.0	59.5	75.5	83.7	85.2	92.0	97.4	92.6	85.9	79.4
				SCN 35-F	AB Noise	Explosive Nail Guns	116.0	2.0	5.0	50%	121.0	76.7	102.1	106.4	112.8	116.1	113.4	115.4	104.4	97.6
				SCN 35-G	AB Noise	Small Tools (Hammers, Drills Etc)	102.0	2.0	0.0	100%	105.0	60.7	86.1	90.4	96.8	100.1	97.4	99.4	88.4	81.6
				SCN 35-H	AB Noise	160t Crawler Crane	104.0	1.0	0.0	50%	101.0	60.5	76.5	84.7	86.2	93.0	98.4	93.6	86.9	80.4
				SCN 35-I	AB Noise	Concrete Line Pump	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 35-J	AB Noise	Elevated Work Platform (EWP)	105.0	1.0	0.0	50%	102.0	58.7	82.4	87.5	87.2	97.8	97.9	93.2	81.5	71.4
				SCN 35-K	AB Noise	Concrete Agitator	112.0	3.0	0.0	100%	116.8	85.9	93.9	102.0	104.4	109.7	112.4	110.9	105.1	99.8
Jun 2020 - Aug 2020	**Standard Construction Hours**	**Northern Concourse & North Entry**	**FRP of Structure (Floor, retaining wall, Columns)**	**SCN 35**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**121.7**	**-**	**-**	**-**	**129.8**	**91.1**	**106.6**	**118.1**	**120.9**	**122.9**	**124.5**	**123.7**	**116.2**	**108.9**
Feb 2021 - Mar2021	Standard Construction Hours	Northern Concourse & North Entry	Demolition Northern Half	SCN 36-A	AB Noise	20t Excavator With Muncher	105.0	1.0	5.0	100%	110.0	67.5	88.2	96.9	99.5	104.8	105.8	101.1	95.8	88.6
				SCN 36-B	AB Noise	Demo Saws	117.0	2.0	5.0	100%	125.0	80.7	106.1	110.4	116.8	120.1	117.4	119.4	108.4	101.6
				SCN 36-C	AB Noise / GB Vibration	Jackhammer	113.0	4.0	5.0	100%	124.0	85.1	99.9	112.6	115.3	116.8	118.7	117.8	110.9	103.2
				SCN 36-D	AB Noise	Oxy Sets	105.0	3.0	0.0	100%	109.8	75.7	97.9	102.2	98.2	103.5	102.0	103.0	98.6	89.4
				SCN 36-E	AB Noise	Trucks	107.0	3.0	0.0	50%	108.8	61.8	81.0	93.1	101.6	103.0	104.2	100.4	93.2	80.1
				SCN 36-F	AB Noise	130 CFM Compressor	100.0	1.0	0.0	100%	100.0	73.7	82.9	89.0	91.5	93.9	93.1	94.3	85.1	79.0
				SCN 36-G	AB Noise	Small Tools (Hammers, Drills Etc)	102.0	2.0	0.0	100%	105.0	60.7	86.1	90.4	96.8	100.1	97.4	99.4	88.4	81.6
				SCN 36-H	AB Noise	Elevated Work Platform (EWP)	105.0	1.0	0.0	50%	102.0	67.9	90.1	94.4	90.4	95.7	94.2	95.2	90.8	81.6
Feb 2021 - Mar2021	**Standard Construction Hours**	**Northern Concourse & North Entry**	**Demolition Northern Half**	**SCN 36**	**AB Noise / GB Vibration**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**119.4**	**-**	**-**	**-**	**127.8**	**87.1**	**107.7**	**115.0**	**119.3**	**122.0**	**121.4**	**121.9**	**113.2**	**105.7**

Proposed Timeframe	Timing Details	Area of Works	Activity	Assessment Scenario ID	Potential Impacts	Equipment	LW, Actual	Quantity	Penalty	Duty Factor	LW, Modified (Q / P / DF)	Spectral Data - dBA per 1/1 Octave - Frequency in Hertz (Hz)								
												31.5	63	125	250	500	1000	2000	4000	90000
Mar 2021 - Jun 2021	Standard Construction Hours	Northern Concourse & North Entry	FRP of Structure (Floor, retaining wall, Columns)	SCN 37-A	AB Noise	Hand Held Vibrators	113.0	2.0	5.0	100%	121.0	74.0	88.7	110.5	111.8	112.9	116.5	114.9	105.8	99.0
				SCN 37-B	AB Noise	Hand Held Masonry Drills	102.0	3.0	0.0	100%	106.8	64.3	85.0	93.7	96.3	101.6	102.6	97.9	92.6	85.4
				SCN 37-C	AB Noise	Truck For Deliveries	107.0	2.0	0.0	50%	107.0	59.9	74.6	98.7	97.7	98.7	102.2	100.5	91.4	84.8
				SCN 37-D	AB Noise	6 Inch Circular Saw	117.0	4.0	5.0	100%	128.0	89.1	103.9	116.6	119.3	120.8	122.7	121.8	114.9	107.2
				SCN 37-E	AB Noise	130 Cfm Compressor	100.0	1.0	0.0	100%	100.0	59.5	75.5	83.7	85.2	92.0	97.4	92.6	85.9	79.4
				SCN 37-F	AB Noise	Explosive Nail Guns	116.0	2.0	5.0	50%	121.0	76.7	102.1	106.4	112.8	116.1	113.4	115.4	104.4	97.6
				SCN 37-G	AB Noise	Small Tools (Hammers, Drills Etc)	102.0	2.0	0.0	100%	105.0	60.7	86.1	90.4	96.8	100.1	97.4	99.4	88.4	81.6
				SCN 37-H	AB Noise	160t Crawler Crane	104.0	1.0	0.0	50%	101.0	60.5	76.5	84.7	86.2	93.0	98.4	93.6	86.9	80.4
				SCN 37-I	AB Noise	Concrete Line Pump	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 37-J	AB Noise	Elevated Work Platform (EWP)	105.0	1.0	0.0	50%	102.0	58.7	82.4	87.5	87.2	97.8	97.9	93.2	81.5	71.4
				SCN 37-K	AB Noise	Concrete Agitator	112.0	3.0	0.0	100%	116.8	85.9	93.9	102.0	104.4	109.7	112.4	110.9	105.1	99.8
Mar 2021 - Jun 2021	**Standard Construction Hours**	**Northern Concourse & North Entry**	**FRP of Structure (Floor, retaining wall, Columns)**	**SCN 37**	**AB Noise**	**TOTAL EMISSION (LW, 15minute in dBA)**	**121.7**	**-**	**-**	**-**	**129.8**	**91.1**	**106.6**	**118.1**	**120.9**	**122.9**	**124.5**	**123.7**	**116.2**	**108.9**
Jun 2021 - Jul 2021	Standard Construction Hours	Northern Concourse & North Entry	Installation of remaining precast columns and Arches	SCN 38-A	AB Noise	160t Crawler Crane	104.0	1.0	0.0	50%	101.0	60.5	76.5	84.7	86.2	93.0	98.4	93.6	86.9	80.4
				SCN 38-B	AB Noise	Elevated Work Platform (EWP)	105.0	2.0	0.0	50%	105.0	61.7	85.4	90.5	90.2	100.8	100.9	96.2	84.5	74.4
				SCN 38-C	AB Noise	Small Tools (Hammers, Drills Etc)	102.0	2.0	0.0	100%	105.0	60.7	86.1	90.4	96.8	100.1	97.4	99.4	88.4	81.6
				SCN 38-D	AB Noise	6 Inch Circular Saw	117.0	4.0	5.0	100%	128.0	89.1	103.9	116.6	119.3	120.8	122.7	121.8	114.9	107.2
				SCN 38-E	AB Noise	Truck For Deliveries	107.0	2.0	0.0	50%	107.0	59.9	74.6	98.7	97.7	98.7	102.2	100.5	91.4	84.8
				SCN 38-F	AB Noise	Hand Held Vibrators	113.0	2.0	5.0	100%	121.0	74.0	88.7	110.5	111.8	112.9	116.5	114.9	105.8	99.0
				SCN 38-G	AB Noise	Concrete Line Pump	109.0	1.0	0.0	100%	109.0	68.5	84.5	92.7	94.2	101.0	106.4	101.6	94.9	88.4
				SCN 38-H	AB Noise	Concrete Agitator	112.0	2.0	0.0	100%	115.0	84.1	92.1	100.2	102.6	107.9	110.6	109.1	103.3	98.0
				SCN 38-I	AB Noise	Welding Machines	105.0	1.0	0.0	100%	105.0	70.9	93.1	97.4	93.4	98.7	97.2	98.2	93.8	84.6
				SCN 38-J	AB Noise	130 CFM Compressor	100.0	1.0	0.0	100%	100.0	73.7	82.9	89.0	91.5	93.9	93.1	94.3	85.1	79.0
Jun 2021 - Jul 2021	**Standard Construction Hours**	**Northern Concourse & North Entry**	**Installation of remaining precast columns and Arches**	**SCN 38**	**AB Noise**	**TOTAL EMISSION (LW, 15minute in dBA)**	**120.4**	**-**	**-**	**-**	**129.1**	**90.6**	**104.8**	**117.7**	**120.2**	**121.8**	**124.0**	**122.9**	**115.8**	**108.3**
Jun 2019 - Oct 2020	24 Hours / Day	Sydney Yard Access Bridge	Heavy Vehicle Traffic on the SYAB	SCN 39-A	AB Noise	Inbound Heavy Vehicles	107.0	9.0	0.0	100%	116.5	72.2	97.6	101.9	108.3	111.6	108.9	110.9	99.9	93.1
				SCN 39-B	AB Noise	Outbound Heavy Vehicles	107.0	9.0	0.0	100%	116.5	72.2	97.6	101.9	108.3	111.6	108.9	110.9	99.9	93.1
Jun 2019 - Oct 2020	**24 Hours / Day**	**Sydney Yard Access Bridge**	**Heavy Vehicle Traffic on the SYAB**	**SCN 39**	**AB Noise**	**TOTAL EMISSION (LW, 15minute in dBA)**	**110.0**	**-**	**-**	**-**	**119.6**	**75.2**	**100.6**	**104.9**	**111.3**	**114.6**	**111.9**	**113.9**	**102.9**	**96.1**

Proposed Timeframe	Timing Details	Area of Works	Activity	Assessment Scenario ID	Potential Impact/s	Equipment	LW, Actual	Quantity	Penalty	Duty Factor	LW, Modified (Q / P / DF)	Calculations for Underground Works (+10dB for reverb noise / -30dB for shielding)	Spectral Data - dBA per 1/1 Octave - Frequency in Hertz (Hz)							
													31.5	63	125	250	500	1000	2000	4000	8000
Apr 2019 - Sept 2019	Day and Night Works	Metro Box - Under the Top Slab	Excavation to underside of Metro Concourse	U-SCN 01-A	AB Noise / GB Vibration / GB Noise	14t Excavators With Hammers	118.0	5.0	5.0	100%	130.0	110.0	69.4	88.1	96.3	96.9	107.8	102.7	98.9	94.1	87.6
				U-SCN 01-B	AB Noise	14t Excavators With Buckets	105.0	5.0	0.0	100%	112.0	92.0	49.5	70.2	78.9	81.5	86.8	87.8	83.1	77.8	70.6
				U-SCN 01-C	AB Noise	Front End Loaders (Cat 918m Or Equivalent)	113.0	5.0	0.0	100%	120.0	100.0	61.2	72.4	88.5	93.7	92.5	93.7	93.7	85.3	81.2
				U-SCN 01-D	AB Noise	Shotcrete Machines	109.0	3.0	0.0	100%	113.8	93.8	53.3	69.3	77.5	79.0	85.8	91.2	86.4	79.7	73.2
Apr 2019 - Sept 2019	**Day and Night Works**	**Metro Box - Under the Top Slab**	**Excavation to underside of Metro Concourse**	**U-SCN 01**	**AB Noise / GB Vibration / GB Noise**	**TOTAL EMISSION (LW, 15minute in dBA)**	**119.7**	**-**	**-**	**-**	**130.6**	**110.6**	**70.1**	**88.4**	**97.1**	**98.7**	**108.0**	**103.6**	**100.3**	**94.8**	**88.7**
Jun 2019 - Feb 2020	Day and Night Works	Metro Box - Under the Top Slab	FRP North South Concourse	U-SCN 02-A	AB Noise	Concrete Vibrators	103.0	3.0	5.0	100%	112.8	92.8	52.3	68.3	76.5	78.0	84.8	90.2	85.4	78.7	72.2
				U-SCN 02-B	AB Noise	Concrete Helicopter / Finishing Machine	106.0	1.0	5.0	100%	111.0	91.0	50.5	66.5	74.7	76.2	83.0	88.4	83.6	76.9	70.4
				U-SCN 02-C	AB Noise	Telehandlers	113.0	2.0	0.0	100%	116.0	96.0	57.2	68.4	84.5	89.7	88.5	89.7	89.7	81.3	77.2
				U-SCN 02-D	AB Noise	Welding Machines	105.0	2.0	0.0	100%	108.0	88.0	53.9	76.1	80.4	76.4	81.7	80.2	81.2	76.8	67.6
				U-SCN 02-E	AB Noise	6 Inch Circular Saw	117.0	10.0	0.0	100%	127.0	107.0	59.9	74.6	98.7	97.7	98.7	102.2	100.5	91.4	84.8
				U-SCN 02-F	AB Noise	130 CFM Compressor	100.0	3.0	0.0	100%	104.8	84.8	58.5	67.7	73.8	76.3	78.7	77.9	79.1	69.9	63.8
				U-SCN 02-G	AB Noise	Explosive Nail Guns	116.0	5.0	5.0	100%	128.0	108.0	69.1	83.9	96.6	99.3	100.8	102.7	101.8	94.9	87.2
				U-SCN 02-H	AB Noise	Small Tools (Hammers, Drills Etc)	102.0	2.0	0.0	100%	105.0	85.0	41.7	65.4	70.5	70.2	80.8	80.9	76.2	64.5	54.4
Jun 2019 - Feb 2020	**Day and Night Works**	**Metro Box - Under the Top Slab**	**FRP North South Concourse**	**U-SCN 02**	**AB Noise**	**TOTAL EMISSION (LW, 15minute in dBA)**	**120.8**	**-**	**-**	**-**	**130.8**	**110.8**	**70.4**	**85.4**	**101.0**	**101.9**	**103.2**	**105.8**	**104.5**	**96.8**	**89.6**
Nov 2019 - Apr 2020	Day and Night Works	Metro Box - Under the Top Slab	Excavation to B2 Level	U-SCN 03-A	AB Noise / GB Vibration / GB Noise	300kw Road Headers	120.0	2.0	5.0	100%	128.0	108.0	65.5	86.2	94.9	97.5	102.8	103.8	99.1	93.8	86.6
				U-SCN 03-B	AB Noise	30t Excavators With Breakers And Rock Saws	122.0	2.0	5.0	100%	130.0	110.0	69.4	88.1	96.3	96.9	107.8	102.7	98.9	94.1	87.6
				U-SCN 03-C	AB Noise	Front End Loaders (Cat 918m Or Equivalent)	113.0	5.0	0.0	100%	120.0	100.0	61.2	72.4	88.5	93.7	92.5	93.7	93.7	85.3	81.2
				U-SCN 03-D	AB Noise	Shotcrete Machines	109.0	1.0	0.0	100%	109.0	89.0	48.5	64.5	72.7	74.2	81.0	86.4	81.6	74.9	68.4
				U-SCN 03-E	AB Noise	Rock Bolting Rigs (Small)	120.0	2.0	0.0	100%	123.0	103.0	60.5	81.2	89.9	92.5	97.8	98.8	94.1	88.8	81.6
Nov 2019 - Apr 2020	**Day and Night Works**	**Metro Box - Under the Top Slab**	**Excavation to B2 Level**	**U-SCN 03**	**AB Noise / GB Vibration / GB Noise**	**TOTAL EMISSION (LW, 15minute in dBA)**	**125.9**	**-**	**-**	**-**	**132.9**	**112.9**	**71.7**	**90.9**	**99.6**	**101.7**	**109.4**	**107.2**	**103.2**	**97.8**	**91.2**
Feb 2020 - Sept 2020	Day and Night Works	Metro Box - Under the Top Slab	FRP B1 to B2 structure	U-SCN 04-A	AB Noise	Concrete Vibrators	103.0	3.0	5.0	100%	112.8	92.8	52.3	68.3	76.5	78.0	84.8	90.2	85.4	78.7	72.2
				U-SCN 04-B	AB Noise	Concrete Helicopter / Finishing Machine	106.0	1.0	5.0	100%	111.0	91.0	50.5	66.5	74.7	76.2	83.0	88.4	83.6	76.9	70.4
				U-SCN 04-C	AB Noise	Telehandlers	113.0	2.0	0.0	100%	116.0	96.0	57.2	68.4	84.5	89.7	88.5	89.7	89.7	81.3	77.2
				U-SCN 04-D	AB Noise	Welding Machines	105.0	2.0	0.0	100%	108.0	88.0	53.9	76.1	80.4	76.4	81.7	80.2	81.2	76.8	67.6
				U-SCN 04-E	AB Noise	6 Inch Circular Saw	117.0	10.0	0.0	100%	127.0	107.0	59.9	74.6	98.7	97.7	98.7	102.2	100.5	91.4	84.8
				U-SCN 04-F	AB Noise	130 CFM Compressor	100.0	3.0	0.0	100%	104.8	84.8	58.5	67.7	73.8	76.3	78.7	77.9	79.1	69.9	63.8
				U-SCN 04-G	AB Noise	Explosive Nail Guns	116.0	5.0	5.0	100%	128.0	108.0	69.1	83.9	96.6	99.3	100.8	102.7	101.8	94.9	87.2
				U-SCN 04-H	AB Noise	Small Tools (Hammers, Drills Etc)	102.0	2.0	0.0	100%	105.0	85.0	41.7	65.4	70.5	70.2	80.8	80.9	76.2	64.5	54.4
				U-SCN 04-I	AB Noise	Scissor Lifts	90.0	4.0	0.0	50%	93.0	73.0	30.5	51.2	59.9	62.5	67.8	68.8	64.1	58.8	51.6
				U-SCN 04-J	AB Noise	Elevated Work Platform (EWP)	105.0	4.0	0.0	50%	108.0	88.0	53.9	76.1	80.4	76.4	81.7	80.2	81.2	76.8	67.6
				U-SCN 04-K	AB Noise	40t Roughie Crane	104.0	1.0	0.0	50%	101.0	81.0	43.4	54.5	64.1	66.3	74.0	74.0	69.9	77.3	66.9
Feb 2020 - Sept 2020	**Day and Night Works**	**Metro Box - Under the Top Slab**	**FRP B1 to B2 structure**	**U-SCN 04**	**AB Noise**	**TOTAL EMISSION (LW, 15minute in dBA)**	**121.1**	**-**	**-**	**-**	**130.9**	**110.9**	**70.5**	**85.8**	**101.0**	**101.9**	**103.3**	**105.8**	**104.5**	**96.9**	**89.7**
Aug. 2020 - Oct 2020	Day and Night Works	Metro Box - Under the Top Slab	Excavation to B4	U-SCN 05-A	AB Noise / GB Vibration / GB Noise	300kw Road Headers	120.0	2.0	5.0	100%	128.0	108.0	65.5	86.2	94.9	97.5	102.8	103.8	99.1	93.8	86.6
				U-SCN 05-B	AB Noise / GB Vibration / GB Noise	30t Excavators With Breakers And Rock Saws	122.0	2.0	5.0	100%	130.0	110.0	69.4	88.1	96.3	96.9	107.8	102.7	98.9	94.1	87.6
				U-SCN 05-C	AB Noise / GB Vibration / GB Noise	20t Excavators With Hammers	122.0	2.0	5.0	100%	130.0	110.0	69.4	88.1	96.3	96.9	107.8	102.7	98.9	94.1	87.6
				U-SCN 05-D	AB Noise	Front End Loaders (Cat 918m Or Equivalent)	113.0	2.0	0.0	100%	116.0	96.0	57.2	68.4	84.5	89.7	88.5	89.7	89.7	81.3	77.2
				U-SCN 05-E	AB Noise	Shotcrete Machines	109.0	1.0	0.0	100%	109.0	89.0	48.5	64.5	72.7	74.2	81.0	86.4	81.6	74.9	68.4
				U-SCN 05-F	AB Noise	Rock Bolting Rigs (Small)	120.0	2.0	0.0	100%	123.0	103.0	60.5	81.2	89.9	92.5	97.8	98.8	94.1	88.8	81.6
Aug. 2020 - Oct 2020	**Day and Night Works**	**Metro Box - Under the Top Slab**	**Excavation to B4**	**U-SCN 05**	**AB Noise / GB Vibration / GB Noise**	**TOTAL EMISSION (LW, 15minute in dBA)**	**127.4**	**-**	**-**	**-**	**134.6**	**114.6**	**73.6**	**92.7**	**101.1**	**102.6**	**111.7**	**108.5**	**104.4**	**99.3**	**92.6**
Nov 2020 - Jun 2021	Day and Night Works	Metro Box - Under the Top Slab	FRP of B4 to B3 Structure	U-SCN 06-A	AB Noise	Concrete Vibrators	103.0	3.0	5.0	100%	112.8	92.8	52.3	68.3	76.5	78.0	84.8	90.2	85.4	78.7	72.2
				U-SCN 06-B	AB Noise	Concrete Helicopter / Finishing Machine	106.0	1.0	5.0	100%	111.0	91.0	50.5	66.5	74.7	76.2	83.0	88.4	83.6	76.9	70.4
				U-SCN 06-C	AB Noise	Telehandlers	113.0	2.0	0.0	100%	116.0	96.0	57.2	68.4	84.5	89.7	88.5	89.7	89.7	81.3	77.2
				U-SCN 06-D	AB Noise	Welding Machines	105.0	2.0	0.0	100%	108.0	88.0	53.9	76.1	80.4	76.4	81.7	80.2	81.2	76.8	67.6
				U-SCN 06-E	AB Noise	6 Inch Circular Saw	117.0	10.0	0.0	100%	127.0	107.0	59.9	74.6	98.7	97.7	98.7	102.2	100.5	91.4	84.8
				U-SCN 06-F	AB Noise	130 Cfm Compressor	100.0	3.0	0.0	100%	104.8	84.8	58.5	67.7	73.8	76.3	78.7	77.9	79.1	69.9	63.8
				U-SCN 06-G	AB Noise	Explosive Nail Guns	116.0	5.0	5.0	100%	128.0	108.0	69.1	83.9	96.6	99.3	100.8	102.7	101.8	94.9	87.2
				U-SCN 06-H	AB Noise	Small Tools (Hammers, Drills Etc)	102.0	2.0	0.0	100%	105.0	85.0	41.7	65.4	70.5	70.2	80.8	80.9	76.2	64.5	54.4
				U-SCN 06-I	AB Noise	40t Roughie Crane	104.0	2.0	0.0	50%	104.0	84.0	46.4	57.5	67.1	69.3	77.0	77.0	72.9	80.3	69.9
				U-SCN 06-J	AB Noise	Scissor Lifts	90.0	4.0	0.0	50%	93.0	73.0	30.5	51.2	59.9	62.5	67.8	68.8	64.1	58.8	51.6
				U-SCN 06-K	AB Noise	Elevated Work Platform (EWP)	105.0	4.0	0.0	50%	108.0	88.0	53.9	76.1	80.4	76.4	81.7	80.2	81.2	76.8	67.6
Nov 2020 - Jun 2021	**Day and Night Works**	**Metro Box - Under the Top Slab**	**FRP of B4 to B3 Structure**	**U-SCN 06**	**AB Noise**	**TOTAL EMISSION (LW, 15minute in dBA)**	**121.1**	**-**	**-**	**-**	**130.9**	**110.9**	**70.5**	**85.8**	**101.0**	**101.9**	**103.3**	**105.8**	**104.5**	**96.9**	**89.7**
Jun 2021 - Dec 2021	Day and Night Works	Metro Box - Under the Top Slab	Finishing Works / Linewide fitout	U-SCN 07-A	AB Noise	Elevated Work Platform (EWP)	105.0	4.0	0.0	50%	108.0	88.0	53.9	76.1	80.4	76.4	81.7	80.2	81.2	76.8	67.6
				U-SCN 07-B	AB Noise	Scissor Lifts	90.0	4.0	0.0	50%	93.0	73.0	30.5	51.2	59.9	62.5	67.8	68.8	64.1	58.8	51.6
				U-SCN 07-C	AB Noise	Tile / Block Saws	117.0	4.0	5.0	100%	128.0	108.0	60.9	75.6	99.7	98.7	99.7	103.2	101.5	92.4	85.8
				U-SCN 07-D	AB Noise	Small Tools	102.0	2.0	0.0	100%	105.0	85.0	41.7	65.4	70.5	70.2	80.8	80.9	76.2	64.5	54.4
Jun 2021 - Dec 2021	**Day and Night Works**	**Metro Box - Under the Top Slab**	**Finishing Works / Linewide fitout**	**U-SCN 07**	**AB Noise**	**TOTAL EMISSION (LW, 15minute in dBA)**	**117.4**	**-**	**-**	**-**	**128.1**	**108.1**	**61.7**	**79.1**	**99.8**	**98.7**	**99.8**	**103.2**	**101.6**	**92.6**	**85.9**
May 2020 - May 2021	Weekend and Weeknight Possessions + weekday works behind hoarding	Central Walk	Installation of Canopy Tubes and Construction of Anchor Blocks	U-SCN 08-A	AB Noise	Canopy Tube Boring Machines (Horizontal)	110.0	2.0	5.0	100%	118.0	98.0	51.0	65.7	87.5	88.8	89.9	93.5	91.9	82.8	76.0
				U-SCN 08-B	AB Noise	Hi Rail Flat Bed	107.0	2.0	0.0	50%	107.0	87.0	42.7	68.1	72.4	78.8	82.1	79.4	81.4	70.4	63.6
				U-SCN 08-C	AB Noise	Hi Rail Concrete Agitator	112.0	1.0	0.0	100%	112.0	92.0	51.5	67.5	75.7	77.2	84.0	89.4	84.6	77.9	71.4
				U-SCN 08-D	AB Noise	Concrete Pump	109.0	1.0	0.0	100%	109.0	89.0	48.5	64.5	72.7	74.2	81.0	86.4	81.6	74.9	68.4
				U-SCN 08-E	AB Noise	25t Crane / Tower Crane In Sydney Yard	105.0	1.0	0.0	50%	102.0	82.0	41.4	60.1	68.3	68.9	79.8	74.7	70.9	66.1	59.6
				U-SCN 08-F	AB Noise	10t Forklift	106.0	1.0	0.0	50%	103.0	83.0	54.9	60.9	66.9	73.9	75.9	77.9	76.9	70.9	66.9
				U-SCN 08-G	AB Noise	Electric Pallet Truck	107.0	1.0	0.0	50%	104.0	84.0	39.7	65.1	69.4	75.8	79.1	76.4	78.4	67.4	60.6
				U-SCN 08-H	AB Noise	5t Electric Hoist	100.0	1.0	0.0	50%	97.0	77.0	50.7	59.9	66.0	68.5	70.9	70.1	71.3	62.1	56.0
				U-SCN 08-I	AB Noise	Truck And Dogs	107.0	2.0	0.0	50%	107.0	87.0	42.7	68.1	72.4	78.8	82.1	79.4	81.4	70.4	63.6
				U-SCN 08-J	AB Noise	Arc Welding Machines	105.0	3.0	0.0	100%	109.8	89.8	55.7	77.9	82.2	78.2	83.5	82.0	83.0	78.6	69.4
				U-SCN 08-K	AB Noise	Drilling Rig	113.0	1.0	5.0	50%	115.0	95.0	48.0	62.7	84.5	85.8	86.9	90.5	88.9	79.8	73.0
				U-SCN 08-L	AB Noise	Ventilation Fans (1m Dia)	95.0	2.0	0.0	100%	98.0	78.0	43.2	59.7	74.9	68.6	72.0	67.9	63.0	55.4	49.8
				U-SCN 08-M	AB Noise	Water Pump (4 Inch)	91.0	1.0	0.0	100%	91.0	71.0	30.5	46.5	54.7	56.2	63.0	68.4	63.6	56.9	50.4
May 2020 - May 2021	**Weekend and Weeknight Possessions + weekday works behind hoarding**	**Central Walk**	**Installation of Canopy Tubes and Construction of Anchor Blocks**	**U-SCN 08**	**AB Noise**	**TOTAL EMISSION (LW, 15minute in dBA)**	**119.1**	**-**	**-**	**-**	**121.6**	**101.6**	**61.1**	**79.8**	**90.6**	**91.8**	**94.2**	**97.1**	**95.3**	**87.0**	**80.1**

Proposed Timeframe	Timing Details	Area of Works	Activity	Assessment Scenario ID	Potential Impact/s	Equipment	LW, Actual	Quantity	Penalty	Duty Factor	LW, Modified (Q1 / P / DF)	Calculations for Underground Works (+10dB for reverberation / -30dB for shielding)	Spectral Data - dBA per 1/1 Octave - Frequency in Hertz (Hz)							
													31.5	63	125	250	500	1000	2000	4000	8000
Aug 2020 - Apr 2022	Weekend Possessions and Weekday Standard hours	Central Walk	Excavation of the Central walk and Escalator Adits + FRP works	U-SCN 09-A	AB Noise / GB Vibration / GB Noise	Road Header	120.0	1.0	5.0	100%	125.0	105.0	62.5	83.2	91.9	94.5	99.8	100.8	96.1	90.8	83.6
				U-SCN 09-B	AB Noise / GB Vibration / GB Noise	10t Excavator (Hydraulic Breaker)	118.0	2.0	5.0	100%	126.0	106.0	63.5	84.2	92.9	95.5	100.8	101.8	97.1	91.8	84.6
				U-SCN 09-C	AB Noise	10t Loader	113.0	1.0	0.0	100%	113.0	93.0	54.2	65.4	81.5	86.7	85.5	86.7	86.7	78.3	74.2
				U-SCN 09-D	AB Noise	Truck And Dogs	107.0	1.0	0.0	50%	104.0	84.0	39.7	65.1	69.4	75.8	79.1	76.4	78.4	67.4	60.6
				U-SCN 09-E	AB Noise	Tower Crane	105.0	1.0	0.0	50%	102.0	82.0	41.4	60.1	68.3	68.9	79.8	74.7	70.9	66.1	59.6
				U-SCN 09-F	AB Noise	Arc Welding Machines	105.0	2.0	0.0	50%	105.0	85.0	50.9	73.1	77.4	73.4	78.7	77.2	78.2	73.8	64.6
				U-SCN 09-G	AB Noise	Waterpoof Welding Machine	105.0	1.0	0.0	50%	102.0	82.0	47.9	70.1	74.4	70.4	75.7	74.2	75.2	70.8	61.6
				U-SCN 09-H	AB Noise	Grout Injection Pump Set	99.0	1.0	0.0	50%	96.0	76.0	41.9	64.1	68.4	64.4	69.7	68.2	69.2	64.8	55.6
				U-SCN 09-I	AB Noise	Concrete Pump	109.0	1.0	0.0	100%	109.0	89.0	48.5	64.5	72.7	74.2	81.0	86.4	81.6	74.9	68.4
				U-SCN 09-J	AB Noise	Concrete Agitator	112.0	1.0	0.0	100%	112.0	92.0	51.5	67.5	75.7	77.2	84.0	89.4	84.6	77.9	71.4
				U-SCN 09-K	AB Noise	Concrete Skip	99.0	1.0	0.0	100%	99.0	79.0	44.9	67.1	71.4	67.4	72.7	71.2	72.2	67.8	58.6
				U-SCN 09-L	AB Noise	4no. Ventilation Fans (1m Dia)	95.0	4.0	0.0	100%	101.0	81.0	46.2	62.7	77.9	71.6	75.0	70.9	66.0	58.4	52.8
				U-SCN 09-M	AB Noise	All Terrain Scissor Lifts	90.0	1.0	0.0	50%	87.0	67.0	32.9	55.1	59.4	55.4	60.7	59.2	60.2	55.8	46.6
				U-SCN 09-N	AB Noise	Water Pump (4 Inch)	91.0	2.0	0.0	100%	94.0	74.0	33.5	49.5	57.7	59.2	66.0	71.4	66.6	59.9	53.4
Aug 2020 - Apr 2022	**Weekend Possessions and Weekday Standard hours**	**Central Walk**	**Excavation of the Central walk and Escalator Adits + FRP works**	**U-SCN 09**	**AB Noise / GB Vibration / GB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**123.5**	**-**	**-**	**-**	**128.9**	**108.9**	**66.8**	**87.2**	**95.9**	**98.5**	**103.5**	**104.6**	**100.2**	**94.7**	**87.5**
Jun 2021 - Sept 2021	Weekday Standard hours	Central Walk	MEP and Fitout of Central Walk	U-SCN 10-A	AB Noise	Hydraulic Jack System For Lift Frames	100.0	1.0	0.0	50%	97.0	77.0	42.9	65.1	69.4	65.4	70.7	69.2	70.2	65.8	56.6
				U-SCN 10-B	AB Noise	10t Hoists For Escalator Truss Installation	100.0	1.0	0.0	50%	97.0	77.0	50.7	59.9	66.0	68.5	70.9	70.1	71.3	62.1	56.0
				U-SCN 10-C	AB Noise	Scissor Lifts	90.0	4.0	0.0	50%	93.0	73.0	38.9	61.1	65.4	61.4	66.7	65.2	66.2	61.8	52.6
				U-SCN 10-D	AB Noise	Ventilation Fans (1m Dia)	95.0	4.0	0.0	100%	101.0	81.0	46.2	62.7	77.9	71.6	75.0	70.9	66.0	58.4	52.8
				U-SCN 10-E	AB Noise	Electric Pallet Truck	107.0	1.0	0.0	50%	104.0	84.0	39.7	65.1	69.4	75.8	79.1	76.4	78.4	67.4	60.6
				U-SCN 10-F	AB Noise	Tower Crane	105.0	1.0	0.0	100%	105.0	85.0	44.4	63.1	71.3	71.9	82.8	77.7	73.9	69.1	62.6
Jun 2021 - Sept 2021	**Weekday Standard hours**	**Central Walk**	**MEP and Fitout of Central Walk**	**U-SCN 10**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**110.2**	**-**	**-**	**-**	**109.1**	**89.1**	**53.5**	**71.0**	**80.0**	**79.0**	**85.2**	**81.4**	**81.0**	**73.3**	**66.2**
Jan 2019 - Dec 2020	Day and Night Works, underground inside the ESR	ESR	FRP works in the ESR Ghost Platform	U-SCN 11-A	AB Noise	Electric Pallet Truck	107.0	1.0	0.0	50%	104.0	84.0	39.7	65.1	69.4	75.8	79.1	76.4	78.4	67.4	60.6
				U-SCN 11-B	AB Noise	Scissor Lift	90.0	1.0	0.0	50%	87.0	67.0	32.9	55.1	59.4	55.4	60.7	59.2	60.2	55.8	46.6
				U-SCN 11-C	AB Noise	2t Hoists	100.0	1.0	0.0	50%	97.0	77.0	50.7	59.9	66.0	68.5	70.9	70.1	71.3	62.1	56.0
				U-SCN 11-D	AB Noise	Ventilation Fans (1m Dia)	95.0	4.0	0.0	100%	101.0	81.0	46.2	62.7	77.9	71.6	75.0	70.9	66.0	58.4	52.8
				U-SCN 11-E	AB Noise	Wire Saw Concrete Cutting Rig	117.0	1.0	5.0	50%	119.0	99.0	51.9	66.6	90.7	89.7	90.7	94.2	92.5	83.4	76.8
				U-SCN 11-F	AB Noise	Floor Saw	117.0	1.0	5.0	50%	119.0	99.0	51.9	66.6	90.7	89.7	90.7	94.2	92.5	83.4	76.8
				U-SCN 11-G	AB Noise	Jackhammer	113.0	1.0	5.0	100%	118.0	98.0	59.1	73.9	86.6	89.3	90.8	92.7	91.8	84.9	77.2
				U-SCN 11-H	AB Noise	Grout Mixer	112.0	1.0	0.0	100%	112.0	92.0	51.5	67.5	75.7	77.2	84.0	89.4	84.6	77.9	71.4
Jan 2019 - Dec 2020	**Day and Night Works, underground inside the ESR**	**ESR**	**FRP works in the ESR Ghost Platform**	**U-SCN 11**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**121.5**	**-**	**-**	**-**	**123.8**	**103.8**	**61.6**	**76.6**	**94.7**	**94.5**	**95.9**	**99.0**	**97.4**	**89.1**	**82.2**
Oct 2018 - Oct 2019	Standard Construction Hours, inside ESR	ESR	Construction of Mini Tunnel from Grand Concourse to Ghost Platform	U-SCN 12-A	AB Noise	10t Hoist In Access Shaft	100.0	1.0	0.0	50%	97.0	77.0	50.7	59.9	66.0	68.5	70.9	70.1	71.3	62.1	56.0
				U-SCN 12-B	AB Noise	Flat Bed Rigid Delivery Trucks	107.0	2.0	0.0	50%	107.0	87.0	42.7	68.1	72.4	78.8	82.1	79.4	81.4	70.4	63.6
				U-SCN 12-C	AB Noise	Jacking Frame For Micro Tunnel Machine	100.0	1.0	0.0	50%	97.0	77.0	42.9	65.1	69.4	65.4	70.7	69.2	70.2	65.8	56.6
				U-SCN 12-D	AB Noise	De Sanding Slurry Plant Equipment	100.0	1.0	0.0	100%	100.0	80.0	45.9	68.1	72.4	68.4	73.7	72.2	73.2	68.8	59.6
				U-SCN 12-E	AB Noise	Hydraulic Power Pack	100.0	1.0	0.0	50%	97.0	77.0	42.9	65.1	69.4	65.4	70.7	69.2	70.2	65.8	56.6
				U-SCN 12-F	AB Noise	Microtunnel Machine (900mm Dia) With Control Cabin	110.0	1.0	5.0	100%	115.0	95.0	48.0	62.7	84.5	85.8	86.9	90.5	88.9	79.8	73.0
				U-SCN 12-G	AB Noise	Water Pump (4 Inch)	91.0	1.0	0.0	100%	91.0	71.0	30.5	46.5	54.7	56.2	63.0	68.4	63.6	56.9	50.4
Oct 2018 - Oct 2019	**Standard Construction Hours, inside ESR**	**ESR**	**Construction of Mini Tunnel from Grand Concourse to Ghost Platform**	**U-SCN 12**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**112.8**	**-**	**-**	**-**	**115.9**	**95.9**	**54.4**	**73.5**	**85.3**	**86.8**	**88.5**	**91.0**	**89.9**	**80.9**	**73.9**
Jul 2019 - Sept 2022	Standard Construction Hours, inside ESR	ESR	MEP Fitout of the Ghost Platform	U-SCN 13-A	AB Noise	10t Hoist In Access Shaft	100.0	1.0	0.0	50%	97.0	77.0	50.7	59.9	66.0	68.5	70.9	70.1	71.3	62.1	56.0
				U-SCN 13-B	AB Noise	Temp Works For Moving Of Transformers	100.0	1.0	0.0	100%	100.0	80.0	45.9	68.1	72.4	68.4	73.7	72.2	73.2	68.8	59.6
				U-SCN 13-C	AB Noise	Scissor Lifts	90.0	1.0	0.0	50%	87.0	67.0	32.9	55.1	59.4	55.4	60.7	59.2	60.2	55.8	46.6
				U-SCN 13-D	AB Noise	Elevated Working Platforms (EWP)	105.0	1.0	0.0	50%	102.0	82.0	47.9	70.1	74.4	70.4	75.7	74.2	75.2	70.8	61.6
				U-SCN 13-E	AB Noise	Grout And Screed Mixers	112.0	1.0	0.0	100%	112.0	92.0	51.5	67.5	75.7	77.2	84.0	89.4	84.6	77.9	71.4
				U-SCN 13-F	AB Noise	Ventilation Fans (1m Dia)	95.0	6.0	0.0	100%	102.8	82.8	48.0	64.5	79.7	73.4	76.8	72.7	67.8	60.2	54.6
Jul 2019 - Sept 2022	**Standard Construction Hours, inside ESR**	**ESR**	**MEP Fitout of the Ghost Platform**	**U-SCN 13**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**113.3**	**-**	**-**	**-**	**113.2**	**93.2**	**56.3**	**74.2**	**82.6**	**80.0**	**85.7**	**89.8**	**85.6**	**79.3**	**72.3**
Oct 2018 - Oct 2020	Daytime Normal Operating Hours and Station Non operating hours, on ESR concourse	ESR	Remodeling of the ESR Concourse Rooms including MEP and Fitout	U-SCN 14-A	AB Noise	Electric Pallet Truck	107.0	1.0	0.0	50%	104.0	84.0	39.7	65.1	69.4	75.8	79.1	76.4	78.4	67.4	60.6
				U-SCN 14-B	AB Noise	Scissor Lifts	90.0	1.0	0.0	100%	90.0	70.0	35.9	58.1	62.4	58.4	63.7	62.2	63.2	58.8	49.6
				U-SCN 14-C	AB Noise	Flat Bed Rigid Delivery Trucks	107.0	2.0	0.0	50%	107.0	87.0	42.7	68.1	72.4	78.8	82.1	79.4	81.4	70.4	63.6
Oct 2018 - Oct 2020	**Daytime Normal Operating Hours and Station Non operating hours, on ESR concourse**	**ESR**	**Remodeling of the ESR Concourse Rooms including MEP and Fitout**	**U-SCN 14**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**110.1**	**-**	**-**	**-**	**108.8**	**88.8**	**45.0**	**70.2**	**74.5**	**80.6**	**83.9**	**81.2**	**83.2**	**72.4**	**65.5**
Oct 2018 - Oct 2020	Daytime Normal Operating Hours and Station Non operating hours	ESR	Breakthroughs from the ESR Concourse to the Central Walk and East Entrance	U-SCN 15-A	AB Noise	Flat Bed Rigid Delivery Trucks	107.0	2.0	0.0	100%	110.0	90.0	45.7	71.1	75.4	81.8	85.1	82.4	84.4	73.4	66.6
				U-SCN 15-B	AB Noise	Wire Saw Concrete Cutting Rig	117.0	1.0	5.0	100%	122.0	102.0	54.9	69.6	93.7	92.7	93.7	97.2	95.5	86.4	79.8
				U-SCN 15-C	AB Noise	Electric Pallet Truck	107.0	1.0	0.0	50%	104.0	84.0	39.7	65.1	69.4	75.8	79.1	76.4	78.4	67.4	60.6
				U-SCN 15-D	AB Noise	2t Electric Hoist	100.0	1.0	0.0	50%	97.0	77.0	50.7	59.9	66.0	68.5	70.9	70.1	71.3	62.1	56.0
Oct 2018 - Oct 2020	**Daytime Normal Operating Hours and Station Non operating hours**	**ESR**	**Breakthroughs from the ESR Concourse to the Central Walk and East Entrance**	**U-SCN 15**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**117.9**	**-**	**-**	**-**	**122.3**	**102.3**	**56.8**	**74.2**	**93.8**	**93.1**	**94.4**	**97.3**	**95.9**	**86.7**	**80.1**
Oct 2020 - Jul 2021	Standard Construction Hours	East Entrance	MEP and Fitout of East Entrance	U-SCN 16-A	AB Noise	10t Hoists For Escalator Truss Installation	100.0	1.0	0.0	50%	97.0	77.0	50.7	59.9	66.0	68.5	70.9	70.1	71.3	62.1	56.0
				U-SCN 16-B	AB Noise	Scissor Lifts	90.0	3.0	0.0	100%	94.8	74.8	40.7	62.9	67.2	63.2	68.5	67.0	68.0	63.6	54.4
				U-SCN 16-C	AB Noise	Ventilation Fans (1m Dia)	95.0	2.0	0.0	100%	98.0	78.0	43.2	59.7	74.9	68.6	72.0	67.9	63.0	55.4	49.8
				U-SCN 16-D	AB Noise	Electric Pallet Truck	107.0	1.0	0.0	50%	104.0	84.0	39.7	65.1	69.4	75.8	79.1	76.4	78.4	67.4	60.6
				U-SCN 16-E	AB Noise	Tower Crane	105.0	1.0	0.0	50%	102.0	82.0	41.4	60.1	68.3	68.9	79.8	74.7	70.9	66.1	59.6
				U-SCN 16-F	AB Noise	Flat Bed Rigid Delivery Trucks	107.0	2.0	0.0	100%	110.0	90.0	45.7	71.1	75.4	81.8	85.1	82.4	84.4	73.4	66.6
Oct 2020 - Jul 2021	**Standard Construction Hours**	**East Entrance**	**MEP and Fitout of East Entrance**	**U-SCN 16**	**AB Noise**	**TOTAL EMISSION (Lw, 15minute in dBA)**	**111.6**	**-**	**-**	**-**	**111.9**	**91.9**	**53.2**	**73.2**	**79.6**	**83.3**	**87.3**	**84.3**	**85.8**	**75.5**	**68.7**

Annex C

Noise Modelling Results

Table C.1	Platforms & Sydney Yard: Stage 6 - Installing Services/Wiring	SCN01	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	34	-36	-36	-36	-36	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	35	-35	-35	-35	-35	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	32	-38	-38	-38	-38	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	39	-31	-31	-31	-31	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	32	-38	-38	-38	-38	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	34	-36	-36	-36	-36	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	33	-37	-37	-37	-37	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	34	-27	-22	-21	-20	-	-	-	-	-	-	-	-
R09	Church - 812 George St	32	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	42	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	46	-24	-24	-24	-24	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	39	-22	-17	-16	-15	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	45	-25	-25	-25	-25	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	48	-22	-22	-22	-22	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	54	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	35	-26	-21	-20	-19	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	58	-6	-1	1	4	-	-	6	9	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	57	2	2	2	2	1	1	-	-	-	-	-	-
R19	Commercial - 18 Lee St	32	-38	-38	-38	-38	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	59	-11	-11	-11	-11	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	58	3	3	3	3	2	2	-	-	-	-	-	-
R22	Residential - 1 Randle St	47	-19	-14	-11	-3	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	56	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	57	-9	-4	-1	7	-	-	-	12	-	-	-	M, LB
R25	Residential - 34 Regent St	54	-10	-5	-3	3	-	-	-	8	-	-	-	-
R26	Commercial (Various) - 11 Randle St	47	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	59	-11	-11	-11	-11	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	57	-9	-4	-1	7	-	-	-	12	-	-	-	M, LB
R30	Commercial (Mils Gallery) - 15 Randle St	34	-36	-36	-36	-36	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	57	-9	-4	-1	7	-	-	-	12	-	-	-	M, LB
R32	Commercial - 419 Elizabeth St	43	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	61	-9	-9	-9	-9	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	53	-7	-7	-7	-7	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	55	-9	-4	-2	4	-	-	-	9	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	50	-10	-10	-10	-10	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	60	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	56	-8	-3	-1	5	-	-	-	10	-	-	-	M, LB
R39	Residential - 73 Regent St	55	-9	-4	-2	4	-	-	-	9	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	59	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	53	-7	-2	-2	4	-	-	-	9	-	-	-	-
R42	Residential - 105 Regent St	34	-30	-25	-23	-17	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	53	-7	-2	-2	4	-	-	-	9	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	38	-32	-32	-32	-32	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	44	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	50	-20	-20	-20	-20	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	50	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	51	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	46	-18	-13	-11	-5	-	-	-	-	-	-	-	-

Table C.2	Platforms & Sydney Yard: Stage 7 - Installing Services / Hoarding / Offices	SCN02	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	33	-37	-37	-37	-37	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	36	-34	-34	-34	-34	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	29	-41	-41	-41	-41	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	35	-35	-35	-35	-35	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	36	-34	-34	-34	-34	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	35	-35	-35	-35	-35	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	33	-37	-37	-37	-37	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	35	-26	-21	-20	-19	-	-	-	-	-	-	-	-
R09	Church - 812 George St	33	-22	-22	-22	-22	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	34	-26	-26	-26	-26	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	41	-29	-29	-29	-29	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	39	-22	-17	-16	-15	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	42	-28	-28	-28	-28	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	49	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	43	-18	-13	-12	-11	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	**81**	17	22	24	27	27	27	29	32	M, LB	M, LB	M, LB	AA, M, IB, LB, PC, RO, SN
R18	Dental Hospital_A (north) - 2 Chalmers St	57	2	2	2	2	1	1	-	-	-	-	-	-
R19	Commercial - 18 Lee St	40	-30	-30	-30	-30	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	74	4	4	4	4	20	20	-	-	M, LB	M, LB	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	57	2	2	2	2	1	1	-	-	-	-	-	-
R22	Residential - 1 Randle St	35	-31	-26	-23	-15	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	57	-3	-3	-3	-3	-	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	58	-8	-3	0	8	-	-	-	13	-	-	-	M, LB
R25	Residential - 34 Regent St	33	-31	-26	-24	-18	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	32	-38	-38	-38	-38	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	33	-37	-37	-37	-37	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	63	-7	-7	-7	-7	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	58	-8	-3	0	8	-	-	-	13	-	-	-	M, LB
R30	Commercial (Mils Gallery) - 15 Randle St	39	-31	-31	-31	-31	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	57	-9	-4	-1	7	-	-	-	12	-	-	-	M, LB
R32	Commercial - 419 Elizabeth St	31	-39	-39	-39	-39	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	59	-11	-11	-11	-11	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	56	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	31	-33	-28	-26	-20	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	52	-8	-8	-8	-8	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	59	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	32	-32	-27	-25	-19	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	30	-34	-29	-27	-21	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	57	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	36	-24	-19	-19	-13	-	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	30	-34	-29	-27	-21	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	41	-19	-14	-14	-8	-	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	25	-45	-45	-45	-45	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	52	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	30	-30	-30	-30	-30	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	42	-28	-28	-28	-28	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	49	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	49	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	41	-23	-18	-16	-10	-	-	-	-	-	-	-	-

Table C.3	Platforms & Sydney Yard: Stage 7, 9 & 11 - Combine Services Route / Demolition of Sydney Yard Buildings / Salvage Canopy / Remove Track / Remove Waste	SCN03	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	40	-30	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	41	-29	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	38	-32	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	45	-25	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	39	-31	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	41	-29	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	39	-31	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	41	-20	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	39	-16	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	48	-12	-	-	-	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	52	-18	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	46	-15	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	51	-19	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	54	-16	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	59	-11	-	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	42	-19	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	63	-1	-	-	-	-	-	-	-	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	62	7	-	-	-	6	-	-	-	-	-	-	-
R19	Commercial - 18 Lee St	39	-31	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	64	-6	-	-	-	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	63	8	-	-	-	7	-	-	-	-	-	-	-
R22	Residential - 1 Randle St	52	-14	-	-	-	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	61	1	-	-	-	5	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	63	-3	-	-	-	-	-	-	-	-	-	-	-
R25	Residential - 34 Regent St	60	-4	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	53	-17	-	-	-	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	61	-9	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	65	-5	-	-	-	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	63	-3	-	-	-	-	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	40	-30	-	-	-	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	62	-4	-	-	-	-	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	49	-21	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	66	-4	-	-	-	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	58	-2	-	-	-	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	61	-3	-	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	56	-4	-	-	-	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	66	-9	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	61	-3	-	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	60	-4	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	64	-11	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	59	-1	-	-	-	-	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	41	-23	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	58	-2	-	-	-	-	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	44	-26	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	61	-9	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	50	-10	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	56	-14	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	55	-10	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	57	2	-	-	-	9	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	51	-13	-	-	-	-	-	-	-	-	-	-	-

Table C.4	Platforms & Sydney Yard: Stage 8 & 10 - OHW on Platform 11/12 / Replace Track Country End 12/13 / Installing CSR	SCN04	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	39	-31	-31	-31	-31	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	40	-30	-30	-30	-30	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	37	-33	-33	-33	-33	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	44	-26	-26	-26	-26	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	38	-32	-32	-32	-32	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	40	-30	-30	-30	-30	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	41	-29	-29	-29	-29	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	40	-21	-16	-15	-14	-	-	-	-	-	-	-	-
R09	Church - 812 George St	39	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	47	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	52	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	46	-15	-10	-9	-8	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	51	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	54	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	60	-10	-10	-10	-10	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	43	-18	-13	-12	-11	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	65	1	6	8	11	11	11	13	16	-	LB	LB	M, LB
R18	Dental Hospital_A (north) - 2 Chalmers St	63	8	8	8	8	7	7	-	-	-	-	-	-
R19	Commercial - 18 Lee St	42	-28	-28	-28	-28	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	63	-7	-7	-7	-7	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	64	9	9	9	9	8	8	-	-	-	-	-	-
R22	Residential - 1 Randle St	46	-20	-15	-12	-4	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	62	2	2	2	2	6	6	9	-	-	-	-	-
R24	Residential - 30 Chalmers St	63	-3	2	5	13	-	7	10	18	-	-	LB	M, LB
R25	Residential - 34 Regent St	34	-30	-25	-23	-17	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	52	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	35	-35	-35	-35	-35	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	61	-9	-9	-9	-9	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	63	-3	2	5	13	-	7	10	18	-	-	LB	M, LB
R30	Commercial (Mils Gallery) - 15 Randle St	38	-32	-32	-32	-32	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	63	-3	2	5	13	-	7	10	18	-	-	LB	M, LB
R32	Commercial - 419 Elizabeth St	38	-32	-32	-32	-32	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	64	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	60	0	0	0	0	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	51	-13	-8	-6	0	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	56	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	62	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	54	-10	-5	-3	3	-	-	-	8	-	-	-	-
R39	Residential - 73 Regent St	53	-11	-6	-4	2	-	-	-	7	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	57	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	51	-9	-4	-4	2	-	-	-	7	-	-	-	-
R42	Residential - 105 Regent St	42	-22	-17	-15	-9	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	52	-8	-3	-3	3	-	-	-	8	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	37	-33	-33	-33	-33	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	51	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	42	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	49	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	46	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	51	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	46	-18	-13	-11	-5	-	-	-	-	-	-	-	-

Table C.5	Platforms & Sydney Yard: Stage 12 - Piling Works / Removing Track	SCN05	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	44	-26	-26	-26	-26	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	45	-25	-25	-25	-25	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	41	-29	-29	-29	-29	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	48	-22	-22	-22	-22	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	42	-28	-28	-28	-28	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	44	-26	-26	-26	-26	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	42	-28	-28	-28	-28	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	44	-17	-12	-11	-10	-	-	-	-	-	-	-	-
R09	Church - 812 George St	42	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	52	-8	-8	-8	-8	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	49	-12	-7	-6	-5	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	57	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	63	-7	-7	-7	-7	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	45	-16	-11	-10	-9	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	67	3	8	10	13	13	13	15	18	-	LB	LB	M, LB
R18	Dental Hospital_A (north) - 2 Chalmers St	66	11	11	11	11	10	10	-	-	-	LB	-	-
R19	Commercial - 18 Lee St	42	-28	-28	-28	-28	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	68	-2	-2	-2	-2	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	67	12	12	12	12	11	11	-	-	-	LB	-	-
R22	Residential - 1 Randle St	56	-10	-5	-2	6	-	-	-	11	-	-	-	M, LB
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	65	5	5	5	5	9	9	12	-	-	-	LB	-
R24	Residential - 30 Chalmers St	67	1	6	9	17	11	11	14	22	-	LB	LB	M, IB, LB, PC, RO, SN
R25	Residential - 34 Regent St	63	-1	4	6	12	-	9	11	17	-	-	LB	M, LB
R26	Commercial (Various) - 11 Randle St	57	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	64	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	68	-2	-2	-2	-2	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	67	1	6	9	17	11	11	14	22	-	LB	LB	M, IB, LB, PC, RO, SN
R30	Commercial (Mils Gallery) - 15 Randle St	44	-26	-26	-26	-26	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	66	0	5	8	16	-	10	13	21	-	LB	LB	M, IB, LB, PC, RO, SN
R32	Commercial - 419 Elizabeth St	53	-17	-17	-17	-17	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	70	0	0	0	0	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	62	2	2	2	2	6	6	9	-	-	-	-	-
R35	Residential - 53 Regent St	65	1	6	8	14	11	11	13	19	-	LB	LB	M, LB
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	60	0	0	0	0	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	69	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	65	1	6	8	14	11	11	13	19	-	LB	LB	M, LB
R39	Residential - 73 Regent St	64	0	5	7	13	-	10	12	18	-	LB	LB	M, LB
R40	Industrial – Sydney Trains, Chalmers St	68	-7	-7	-7	-7	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	63	3	8	8	14	13	13	13	19	-	LB	LB	M, LB
R42	Residential - 105 Regent St	45	-19	-14	-12	-6	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	62	2	7	7	13	12	12	12	18	-	LB	LB	M, LB
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	47	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	65	-5	-5	-5	-5	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	53	-7	-7	-7	-7	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	59	-11	-11	-11	-11	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	59	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	60	5	5	5	5	12	12	12	-	-	LB	LB	-
R50	Residential - 141 Regent St	55	-9	-4	-2	4	-	-	-	9	-	-	-	-

Table C.6	Platforms & Sydney Yard: Stage 13	SCN06	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	41	-29	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	42	-28	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	38	-32	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	46	-24	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	39	-31	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	41	-29	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	40	-30	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	41	-20	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	39	-16	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	49	-11	-	-	-	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	53	-17	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	46	-15	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	52	-18	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	55	-15	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	60	-10	-	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	42	-19	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	65	1	-	-	-	11	-	-	-	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	63	8	-	-	-	7	-	-	-	-	-	-	-
R19	Commercial - 18 Lee St	39	-31	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	65	-5	-	-	-	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	64	9	-	-	-	8	-	-	-	-	-	-	-
R22	Residential - 1 Randle St	53	-13	-	-	-	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	62	2	-	-	-	6	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	64	-2	-	-	-	-	-	-	-	-	-	-	-
R25	Residential - 34 Regent St	61	-3	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	54	-16	-	-	-	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	62	-8	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	66	-4	-	-	-	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	64	-2	-	-	-	-	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	41	-29	-	-	-	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	63	-3	-	-	-	-	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	50	-20	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	67	-3	-	-	-	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	59	-1	-	-	-	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	62	-2	-	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	57	-3	-	-	-	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	67	-8	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	62	-2	-	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	61	-3	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	65	-10	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	60	0	-	-	-	-	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	41	-23	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	59	-1	-	-	-	-	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	44	-26	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	62	-8	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	51	-9	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	57	-13	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	57	-8	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	58	3	-	-	-	10	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	53	-11	-	-	-	-	-	-	-	-	-	-	-

Table C.7	Platforms & Sydney Yard: Stage 14, 16, 18 & 20	SCN07	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	41	-29	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	43	-27	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	39	-31	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	46	-24	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	40	-30	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	42	-28	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	40	-30	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	42	-19	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	40	-15	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	50	-10	-	-	-	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	53	-17	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	47	-14	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	53	-17	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	55	-15	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	61	-9	-	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	43	-18	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	66	2	-	-	-	12	-	-	-	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	64	9	-	-	-	8	-	-	-	-	-	-	-
R19	Commercial - 18 Lee St	40	-30	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	66	-4	-	-	-	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	65	10	-	-	-	9	-	-	-	-	-	-	-
R22	Residential - 1 Randle St	54	-12	-	-	-	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	63	3	-	-	-	7	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	65	-1	-	-	-	-	-	-	-	-	-	-	-
R25	Residential - 34 Regent St	62	-2	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	55	-15	-	-	-	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	63	-7	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	67	-3	-	-	-	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	65	-1	-	-	-	-	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	42	-28	-	-	-	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	64	-2	-	-	-	-	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	51	-19	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	68	-2	-	-	-	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	60	0	-	-	-	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	63	-1	-	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	58	-2	-	-	-	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	68	-7	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	63	-1	-	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	62	-2	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	66	-9	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	61	1	-	-	-	11	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	42	-22	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	60	0	-	-	-	-	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	45	-25	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	63	-7	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	51	-9	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	58	-12	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	58	-7	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	59	4	-	-	-	11	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	53	-11	-	-	-	-	-	-	-	-	-	-	-

Table C.8	Platforms & Sydney Yard: Stage 15,17 & 19	SCN08	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	43	-27	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	44	-26	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	41	-29	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	47	-23	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	41	-29	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	43	-27	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	42	-28	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	43	-18	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	41	-14	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	51	-9	-	-	-	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	55	-15	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	48	-13	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	54	-16	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	57	-13	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	63	-7	-	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	44	-17	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	67	3	-	-	-	13	-	-	-	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	66	11	-	-	-	10	-	-	-	-	-	-	-
R19	Commercial - 18 Lee St	41	-29	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	67	-3	-	-	-	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	67	12	-	-	-	11	-	-	-	-	-	-	-
R22	Residential - 1 Randle St	56	-10	-	-	-	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	64	4	-	-	-	8	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	66	0	-	-	-	-	-	-	-	-	-	-	-
R25	Residential - 34 Regent St	63	-1	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	56	-14	-	-	-	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	64	-6	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	68	-2	-	-	-	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	66	0	-	-	-	-	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	43	-27	-	-	-	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	65	-1	-	-	-	-	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	52	-18	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	69	-1	-	-	-	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	61	1	-	-	-	5	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	64	0	-	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	59	-1	-	-	-	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	69	-6	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	64	0	-	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	64	0	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	67	-8	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	62	2	-	-	-	12	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	44	-20	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	61	1	-	-	-	11	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	46	-24	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	64	-6	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	53	-7	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	59	-11	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	59	-6	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	60	5	-	-	-	12	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	55	-9	-	-	-	-	-	-	-	-	-	-	-

Table C.9	Metro Box: Piling for the box perimeter and the plunge columns	SCN09	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	43	-27	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	44	-26	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	40	-30	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	50	-20	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	42	-28	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	44	-26	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	44	-26	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	43	-18	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	42	-13	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	55	-5	-	-	-	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	58	-12	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	50	-11	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	56	-14	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	59	-11	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	66	-4	-	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	46	-15	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	69	5	-	-	-	15	-	-	-	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	69	14	-	-	-	13	-	-	-	-	-	-	-
R19	Commercial - 18 Lee St	45	-25	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	67	-3	-	-	-	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	70	15	-	-	-	14	-	-	-	-	-	-	-
R22	Residential - 1 Randle St	55	-11	-	-	-	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	68	8	-	-	-	12	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	69	3	-	-	-	13	-	-	-	-	-	-	-
R25	Residential - 34 Regent St	38	-26	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	59	-11	-	-	-	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	39	-31	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	66	-4	-	-	-	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	69	3	-	-	-	13	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	43	-27	-	-	-	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	69	3	-	-	-	13	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	43	-27	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	70	0	-	-	-	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	65	5	-	-	-	9	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	58	-6	-	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	62	2	-	-	-	6	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	68	-7	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	60	-4	-	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	58	-6	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	62	-13	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	56	-4	-	-	-	-	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	43	-21	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	57	-3	-	-	-	-	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	41	-29	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	57	-13	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	47	-13	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	55	-15	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	51	-14	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	56	1	-	-	-	8	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	53	-11	-	-	-	-	-	-	-	-	-	-	-

Table C.10	Metro Box: FRP Capping Beam	SCN10	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	43	-27	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	44	-26	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	40	-30	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	50	-20	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	42	-28	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	44	-26	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	44	-26	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	43	-18	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	42	-13	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	55	-5	-	-	-	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	58	-12	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	50	-11	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	56	-14	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	59	-11	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	66	-4	-	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	46	-15	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	69	5	-	-	-	15	-	-	-	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	69	14	-	-	-	13	-	-	-	-	-	-	-
R19	Commercial - 18 Lee St	45	-25	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	67	-3	-	-	-	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	70	15	-	-	-	14	-	-	-	-	-	-	-
R22	Residential - 1 Randle St	55	-11	-	-	-	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	68	8	-	-	-	12	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	69	3	-	-	-	13	-	-	-	-	-	-	-
R25	Residential - 34 Regent St	38	-26	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	59	-11	-	-	-	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	39	-31	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	66	-4	-	-	-	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	69	3	-	-	-	13	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	43	-27	-	-	-	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	69	3	-	-	-	13	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	43	-27	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	70	0	-	-	-	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	65	5	-	-	-	9	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	58	-6	-	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	62	2	-	-	-	6	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	68	-7	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	60	-4	-	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	58	-6	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	62	-13	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	56	-4	-	-	-	-	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	43	-21	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	57	-3	-	-	-	-	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	41	-29	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	57	-13	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	47	-13	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	55	-15	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	51	-14	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	56	1	-	-	-	8	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	53	-11	-	-	-	-	-	-	-	-	-	-	-

Table C.11	Metro Box: Excavation to underside of Intercity Slab	SCN11	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	43	-27	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	44	-26	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	40	-30	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	50	-20	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	42	-28	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	44	-26	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	44	-26	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	43	-18	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	42	-13	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	55	-5	-	-	-	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	58	-12	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	50	-11	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	56	-14	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	59	-11	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	66	-4	-	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	46	-15	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	69	5	-	-	-	15	-	-	-	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	69	14	-	-	-	13	-	-	-	-	-	-	-
R19	Commercial - 18 Lee St	45	-25	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	67	-3	-	-	-	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	70	15	-	-	-	14	-	-	-	-	-	-	-
R22	Residential - 1 Randle St	55	-11	-	-	-	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	68	8	-	-	-	12	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	69	3	-	-	-	13	-	-	-	-	-	-	-
R25	Residential - 34 Regent St	38	-26	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	59	-11	-	-	-	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	39	-31	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	66	-4	-	-	-	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	69	3	-	-	-	13	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	43	-27	-	-	-	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	69	3	-	-	-	13	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	43	-27	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	70	0	-	-	-	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	65	5	-	-	-	9	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	58	-6	-	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	62	2	-	-	-	6	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	68	-7	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	60	-4	-	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	58	-6	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	62	-13	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	56	-4	-	-	-	-	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	43	-21	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	57	-3	-	-	-	-	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	41	-29	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	57	-13	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	47	-13	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	55	-15	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	51	-14	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	56	1	-	-	-	8	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	53	-11	-	-	-	-	-	-	-	-	-	-	-

Table C.12	Metro Box: FRP Platform and Intercity slab	SCN12	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	49	-21	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	50	-20	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	46	-24	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	55	-15	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	48	-22	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	51	-19	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	50	-20	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	49	-12	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	48	-7	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	60	0	-	-	-	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	63	-7	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	56	-5	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	62	-8	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	65	-5	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	71	1	-	-	-	15	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	52	-9	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	74	10	-	-	-	20	-	-	-	M, LB	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	74	19	-	-	-	18	-	-	-	-	-	-	-
R19	Commercial - 18 Lee St	51	-19	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	73	3	-	-	-	19	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	**75**	20	-	-	-	19	-	-	-	-	-	-	-
R22	Residential - 1 Randle St	60	-6	-	-	-	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	73	13	-	-	-	17	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	74	8	-	-	-	18	-	-	-	-	-	-	-
R25	Residential - 34 Regent St	44	-20	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	64	-6	-	-	-	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	45	-25	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	71	1	-	-	-	17	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	74	8	-	-	-	18	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	49	-21	-	-	-	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	74	8	-	-	-	18	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	49	-21	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	**75**	5	-	-	-	19	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	71	11	-	-	-	15	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	63	-1	-	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	67	7	-	-	-	11	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	73	-2	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	65	1	-	-	-	11	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	64	0	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	67	-8	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	62	2	-	-	-	12	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	49	-15	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	62	2	-	-	-	12	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	47	-23	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	62	-8	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	53	-7	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	60	-10	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	57	-8	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	61	6	-	-	-	13	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	58	-6	-	-	-	-	-	-	-	-	-	-	-

Table C.13	Metro Box: Excavation to underside of Metro Concourse	SCN13	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	41	-29	-29	-29	-29	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	42	-28	-28	-28	-28	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	38	-32	-32	-32	-32	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	48	-22	-22	-22	-22	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	40	-30	-30	-30	-30	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	43	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	42	-28	-28	-28	-28	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	41	-20	-15	-14	-13	-	-	-	-	-	-	-	-
R09	Church - 812 George St	41	-14	-14	-14	-14	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	53	-7	-7	-7	-7	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	56	-14	-14	-14	-14	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	48	-13	-8	-7	-6	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	58	-12	-12	-12	-12	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	64	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	44	-17	-12	-11	-10	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	67	3	8	10	13	13	13	15	18	-	LB	LB	M, LB
R18	Dental Hospital_A (north) - 2 Chalmers St	67	12	12	12	12	11	11	-	-	-	LB	-	-
R19	Commercial - 18 Lee St	43	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	66	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	68	13	13	13	13	12	12	-	-	-	LB	-	-
R22	Residential - 1 Randle St	53	-13	-8	-5	3	-	-	-	8	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	66	6	6	6	6	10	10	13	-	-	LB	LB	-
R24	Residential - 30 Chalmers St	67	1	6	9	17	11	11	14	22	-	LB	LB	M, IB, LB, PC, RO, SN
R25	Residential - 34 Regent St	36	-28	-23	-21	-15	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	57	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	37	-33	-33	-33	-33	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	64	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	67	1	6	9	17	11	11	14	22	-	LB	LB	M, IB, LB, PC, RO, SN
R30	Commercial (Mils Gallery) - 15 Randle St	41	-29	-29	-29	-29	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	67	1	6	9	17	11	11	14	22	-	LB	LB	M, IB, LB, PC, RO, SN
R32	Commercial - 419 Elizabeth St	42	-28	-28	-28	-28	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	68	-2	-2	-2	-2	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	64	4	4	4	4	8	8	11	-	-	-	LB	-
R35	Residential - 53 Regent St	56	-8	-3	-1	5	-	-	-	10	-	-	-	M, LB
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	60	0	0	0	0	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	66	-9	-9	-9	-9	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	58	-6	-1	1	7	-	-	6	12	-	-	-	M, LB
R39	Residential - 73 Regent St	57	-7	-2	0	6	-	-	-	11	-	-	-	M, LB
R40	Industrial – Sydney Trains, Chalmers St	60	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	55	-5	0	0	6	-	-	-	11	-	-	-	M, LB
R42	Residential - 105 Regent St	41	-23	-18	-16	-10	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	55	-5	0	0	6	-	-	-	11	-	-	-	M, LB
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	40	-30	-30	-30	-30	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	46	-14	-14	-14	-14	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	53	-17	-17	-17	-17	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	50	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	54	-1	-1	-1	-1	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	51	-13	-8	-6	0	-	-	-	-	-	-	-	-

Table C.14	Metro Box: Ongoing Logistical support of Box Construction	SCN14	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	45	-25	-25	-25	-25	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	46	-24	-24	-24	-24	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	42	-28	-28	-28	-28	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	52	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	44	-26	-26	-26	-26	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	47	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	46	-24	-24	-24	-24	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	45	-16	-11	-10	-9	-	-	-	-	-	-	-	-
R09	Church - 812 George St	44	-11	-11	-11	-11	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	57	-3	-3	-3	-3	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	60	-10	-10	-10	-10	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	52	-9	-4	-3	-2	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	59	-11	-11	-11	-11	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	62	-8	-8	-8	-8	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	68	-2	-2	-2	-2	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	48	-13	-8	-7	-6	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	71	7	12	14	17	17	17	19	22	-	LB	LB	M, IB, LB, PC, RO, SN
R18	Dental Hospital_A (north) - 2 Chalmers St	71	16	16	16	16	15	15	-	-	-	LB	-	-
R19	Commercial - 18 Lee St	47	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	69	-1	-1	-1	-1	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	72	17	17	17	17	16	16	-	-	-	LB	-	-
R22	Residential - 1 Randle St	57	-9	-4	-1	7	-	-	-	12	-	-	-	M, LB
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	70	10	10	10	10	14	14	17	-	-	LB	LB	-
R24	Residential - 30 Chalmers St	71	5	10	13	21	15	15	18	26	-	LB	LB	M, IB, LB, PC, RO, SN
R25	Residential - 34 Regent St	40	-24	-19	-17	-11	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	61	-9	-9	-9	-9	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	41	-29	-29	-29	-29	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	68	-2	-2	-2	-2	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	71	5	10	13	21	15	15	18	26	-	LB	LB	M, IB, LB, PC, RO, SN
R30	Commercial (Mils Gallery) - 15 Randle St	45	-25	-25	-25	-25	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	71	5	10	13	21	15	15	18	26	-	LB	LB	M, IB, LB, PC, RO, SN
R32	Commercial - 419 Elizabeth St	45	-25	-25	-25	-25	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	72	2	2	2	2	16	16	-	-	-	LB	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	68	8	8	8	8	12	12	15	-	-	LB	LB	-
R35	Residential - 53 Regent St	60	-4	1	3	9	-	6	8	14	-	-	-	M, LB
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	64	4	4	4	4	8	8	11	-	-	-	LB	-
R37	Industrial (Substation) - Chalmers St	70	-5	-5	-5	-5	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	62	-2	3	5	11	-	8	10	16	-	-	LB	M, LB
R39	Residential - 73 Regent St	60	-4	1	3	9	-	6	8	14	-	-	-	M, LB
R40	Industrial – Sydney Trains, Chalmers St	64	-11	-11	-11	-11	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	58	-2	3	3	9	-	8	8	14	-	-	-	M, LB
R42	Residential - 105 Regent St	45	-19	-14	-12	-6	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	59	-1	4	4	10	-	9	9	15	-	-	-	M, LB
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	44	-26	-26	-26	-26	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	59	-11	-11	-11	-11	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	50	-10	-10	-10	-10	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	57	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	54	-11	-11	-11	-11	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	58	3	3	3	3	10	10	10	-	-	LB	LB	-
R50	Residential - 141 Regent St	55	-9	-4	-2	4	-	-	-	9	-	-	-	-

Table C.15	Central Walk: Site investigation Works (Tracks 16- 23)	SCN15	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	34	-36	-36	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	46	-24	-24	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	32	-38	-38	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	43	-27	-27	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	35	-35	-35	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	35	-35	-35	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	50	-20	-20	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	34	-27	-22	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	35	-20	-20	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	53	-7	-7	-	-	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	52	-18	-18	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	42	-19	-14	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	52	-18	-18	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	55	-15	-15	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	63	-7	-7	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	37	-24	-19	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	62	-2	3	-	-	-	8	-	-	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	67	12	12	-	-	11	11	-	-	-	LB	-	-
R19	Commercial - 18 Lee St	37	-33	-33	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	61	-9	-9	-	-	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	72	17	17	-	-	16	16	-	-	-	LB	-	-
R22	Residential - 1 Randle St	45	-21	-16	-	-	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	69	9	9	-	-	13	13	-	-	-	LB	-	-
R24	Residential - 30 Chalmers St	72	6	11	-	-	16	16	-	-	-	LB	-	-
R25	Residential - 34 Regent St	30	-34	-29	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	55	-15	-15	-	-	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	31	-39	-39	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	59	-11	-11	-	-	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	69	3	8	-	-	13	13	-	-	-	LB	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	42	-28	-28	-	-	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	68	2	7	-	-	12	12	-	-	-	LB	-	-
R32	Commercial - 419 Elizabeth St	40	-30	-30	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	64	-6	-6	-	-	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	57	-3	-3	-	-	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	55	-9	-4	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	62	2	2	-	-	6	6	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	61	-14	-14	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	55	-9	-4	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	54	-10	-5	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	56	-19	-19	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	53	-7	-2	-	-	-	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	33	-31	-26	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	52	-8	-3	-	-	-	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	36	-34	-34	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	52	-18	-18	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	43	-17	-17	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	51	-19	-19	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	49	-16	-16	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	51	-4	-4	-	-	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	48	-16	-11	-	-	-	-	-	-	-	-	-	-

Table C.16	Central Walk: Construction of Olympic Stairs (Temp) - Platform 20/21 and 22/23	SCN16A	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	29	-41	-41	-41	-41	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	39	-31	-31	-31	-31	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	27	-43	-43	-43	-43	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	37	-33	-33	-33	-33	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	29	-41	-41	-41	-41	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	30	-40	-40	-40	-40	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	44	-26	-26	-26	-26	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	28	-33	-28	-27	-26	-	-	-	-	-	-	-	-
R09	Church - 812 George St	29	-26	-26	-26	-26	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	47	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	46	-24	-24	-24	-24	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	37	-24	-19	-18	-17	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	46	-24	-24	-24	-24	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	49	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	58	-12	-12	-12	-12	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	32	-29	-24	-23	-22	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	56	-8	-3	-1	2	-	-	-	7	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	62	7	7	7	7	6	6	-	-	-	-	-	-
R19	Commercial - 18 Lee St	30	-40	-40	-40	-40	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	67	12	12	12	12	11	11	-	-	-	LB	-	-
R22	Residential - 1 Randle St	40	-26	-21	-18	-10	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	64	4	4	4	4	8	8	11	-	-	-	LB	-
R24	Residential - 30 Chalmers St	67	1	6	9	17	11	11	14	22	-	LB	LB	M, IB, LB, PC, RO, SN
R25	Residential - 34 Regent St	24	-40	-35	-33	-27	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	50	-20	-20	-20	-20	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	24	-46	-46	-46	-46	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	53	-17	-17	-17	-17	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	64	-2	3	6	14	-	8	11	19	-	-	LB	M, LB
R30	Commercial (Mils Gallery) - 15 Randle St	37	-33	-33	-33	-33	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	63	-3	2	5	13	-	7	10	18	-	-	LB	M, LB
R32	Commercial - 419 Elizabeth St	35	-35	-35	-35	-35	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	58	-12	-12	-12	-12	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	51	-9	-9	-9	-9	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	48	-16	-11	-9	-3	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	56	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	56	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	48	-16	-11	-9	-3	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	47	-17	-12	-10	-4	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	50	-25	-25	-25	-25	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	46	-14	-9	-9	-3	-	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	28	-36	-31	-29	-23	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	45	-15	-10	-10	-4	-	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	29	-41	-41	-41	-41	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	45	-25	-25	-25	-25	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	37	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	43	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	42	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	44	-11	-11	-11	-11	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	40	-24	-19	-17	-11	-	-	-	-	-	-	-	-

Table C.16	Central Walk: Construction of Olympic Stairs (Temp) - Platform 20/21 and 22/23	SCN16B	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	35	-35	-35	-35	-35	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	44	-26	-26	-26	-26	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	33	-37	-37	-37	-37	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	43	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	35	-35	-35	-35	-35	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	35	-35	-35	-35	-35	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	49	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	34	-27	-22	-21	-20	-	-	-	-	-	-	-	-
R09	Church - 812 George St	34	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	52	-8	-8	-8	-8	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	51	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	43	-18	-13	-12	-11	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	51	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	54	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	62	-8	-8	-8	-8	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	37	-24	-19	-18	-17	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	61	-3	2	4	7	-	7	9	12	-	-	-	M, LB
R18	Dental Hospital_A (north) - 2 Chalmers St	67	12	12	12	12	11	11	-	-	-	LB	-	-
R19	Commercial - 18 Lee St	35	-35	-35	-35	-35	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	59	-11	-11	-11	-11	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	72	17	17	17	17	16	16	-	-	-	LB	-	-
R22	Residential - 1 Randle St	46	-20	-15	-12	-4	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	69	9	9	9	9	13	13	16	-	-	LB	LB	-
R24	Residential - 30 Chalmers St	71	5	10	13	21	15	15	18	26	-	LB	LB	M, IB, LB, PC, RO, SN
R25	Residential - 34 Regent St	29	-35	-30	-28	-22	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	29	-41	-41	-41	-41	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	58	-12	-12	-12	-12	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	69	3	8	11	19	13	13	16	24	-	LB	LB	M, IB, LB, PC, RO, SN
R30	Commercial (Mils Gallery) - 15 Randle St	42	-28	-28	-28	-28	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	67	1	6	9	17	11	11	14	22	-	LB	LB	M, IB, LB, PC, RO, SN
R32	Commercial - 419 Elizabeth St	40	-30	-30	-30	-30	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	63	-7	-7	-7	-7	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	56	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	53	-11	-6	-4	2	-	-	-	7	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	61	1	1	1	1	5	5	8	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	61	-14	-14	-14	-14	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	53	-11	-6	-4	2	-	-	-	7	-	-	-	-
R39	Residential - 73 Regent St	52	-12	-7	-5	1	-	-	-	6	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	54	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	51	-9	-4	-4	2	-	-	-	7	-	-	-	-
R42	Residential - 105 Regent St	33	-31	-26	-24	-18	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	50	-10	-5	-5	1	-	-	-	6	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	35	-35	-35	-35	-35	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	50	-20	-20	-20	-20	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	42	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	48	-22	-22	-22	-22	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	47	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	49	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	45	-19	-14	-12	-6	-	-	-	-	-	-	-	-

Table C.16	Central Walk: Construction of Olympic Stairs (Temp) - Platform 20/21 and 22/23	SCN16C	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	34	-36	-36	-36	-36	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	45	-25	-25	-25	-25	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	32	-38	-38	-38	-38	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	43	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	34	-36	-36	-36	-36	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	34	-36	-36	-36	-36	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	50	-20	-20	-20	-20	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	32	-29	-24	-23	-22	-	-	-	-	-	-	-	-
R09	Church - 812 George St	34	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	53	-7	-7	-7	-7	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	51	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	41	-20	-15	-14	-13	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	51	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	54	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	63	-7	-7	-7	-7	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	36	-25	-20	-19	-18	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	61	-3	2	4	7	-	7	9	12	-	-	-	M, LB
R18	Dental Hospital_A (north) - 2 Chalmers St	67	12	12	12	12	11	11	-	-	-	LB	-	-
R19	Commercial - 18 Lee St	35	-35	-35	-35	-35	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	60	-10	-10	-10	-10	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	72	17	17	17	17	16	16	-	-	-	LB	-	-
R22	Residential - 1 Randle St	44	-22	-17	-14	-6	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	69	9	9	9	9	13	13	16	-	-	LB	LB	-
R24	Residential - 30 Chalmers St	71	5	10	13	21	15	15	18	26	-	LB	LB	M, IB, LB, PC, RO, SN
R25	Residential - 34 Regent St	29	-35	-30	-28	-22	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	29	-41	-41	-41	-41	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	59	-11	-11	-11	-11	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	69	3	8	11	19	13	13	16	24	-	LB	LB	M, IB, LB, PC, RO, SN
R30	Commercial (Mils Gallery) - 15 Randle St	41	-29	-29	-29	-29	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	68	2	7	10	18	12	12	15	23	-	LB	LB	M, IB, LB, PC, RO, SN
R32	Commercial - 419 Elizabeth St	39	-31	-31	-31	-31	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	63	-7	-7	-7	-7	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	57	-3	-3	-3	-3	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	54	-10	-5	-3	3	-	-	-	8	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	62	2	2	2	2	6	6	9	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	61	-14	-14	-14	-14	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	54	-10	-5	-3	3	-	-	-	8	-	-	-	-
R39	Residential - 73 Regent St	53	-11	-6	-4	2	-	-	-	7	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	55	-20	-20	-20	-20	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	52	-8	-3	-3	3	-	-	-	8	-	-	-	-
R42	Residential - 105 Regent St	32	-32	-27	-25	-19	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	51	-9	-4	-4	2	-	-	-	7	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	34	-36	-36	-36	-36	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	51	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	43	-17	-17	-17	-17	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	50	-20	-20	-20	-20	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	48	-17	-17	-17	-17	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	51	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	47	-17	-12	-10	-4	-	-	-	-	-	-	-	-

Table C.16	Central Walk: Construction of Olympic Stairs (Temp) - Platform 20/21 and 22/23	SCN16D	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	32	-38	-38	-38	-38	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	43	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	30	-40	-40	-40	-40	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	41	-29	-29	-29	-29	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	32	-38	-38	-38	-38	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	33	-37	-37	-37	-37	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	48	-22	-22	-22	-22	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	31	-30	-25	-24	-23	-	-	-	-	-	-	-	-
R09	Church - 812 George St	32	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	51	-9	-9	-9	-9	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	49	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	40	-21	-16	-15	-14	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	50	-20	-20	-20	-20	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	53	-17	-17	-17	-17	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	61	-9	-9	-9	-9	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	35	-26	-21	-20	-19	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	60	-4	1	3	6	-	6	8	11	-	-	-	M, LB
R18	Dental Hospital_A (north) - 2 Chalmers St	66	11	11	11	11	10	10	-	-	-	LB	-	-
R19	Commercial - 18 Lee St	34	-36	-36	-36	-36	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	59	-11	-11	-11	-11	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	70	15	15	15	15	14	14	-	-	-	LB	-	-
R22	Residential - 1 Randle St	43	-23	-18	-15	-7	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	68	8	8	8	8	12	12	15	-	-	LB	LB	-
R24	Residential - 30 Chalmers St	70	4	9	12	20	14	14	17	25	-	LB	LB	M, IB, LB, PC, RO, SN
R25	Residential - 34 Regent St	27	-37	-32	-30	-24	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	53	-17	-17	-17	-17	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	28	-42	-42	-42	-42	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	57	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	68	2	7	10	18	12	12	15	23	-	LB	LB	M, IB, LB, PC, RO, SN
R30	Commercial (Mils Gallery) - 15 Randle St	40	-30	-30	-30	-30	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	66	0	5	8	16	-	10	13	21	-	LB	LB	M, IB, LB, PC, RO, SN
R32	Commercial - 419 Elizabeth St	38	-32	-32	-32	-32	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	62	-8	-8	-8	-8	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	55	-5	-5	-5	-5	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	53	-11	-6	-4	2	-	-	-	7	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	60	0	0	0	0	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	60	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	53	-11	-6	-4	2	-	-	-	7	-	-	-	-
R39	Residential - 73 Regent St	51	-13	-8	-6	0	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	54	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	51	-9	-4	-4	2	-	-	-	7	-	-	-	-
R42	Residential - 105 Regent St	31	-33	-28	-26	-20	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	50	-10	-5	-5	1	-	-	-	6	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	33	-37	-37	-37	-37	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	49	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	41	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	48	-22	-22	-22	-22	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	46	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	49	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	45	-19	-14	-12	-6	-	-	-	-	-	-	-	-

Table C.17	Central Walk: Construction of the new Standby Guards Rooms / demolition of existing standby guards rooms	SCN17	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	42	-28	-28	-28	-28	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	50	-20	-20	-20	-20	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	40	-30	-30	-30	-30	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	48	-22	-22	-22	-22	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	43	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	43	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	54	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	41	-20	-15	-14	-13	-	-	-	-	-	-	-	-
R09	Church - 812 George St	42	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	57	-3	-3	-3	-3	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	56	-14	-14	-14	-14	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	50	-11	-6	-5	-4	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	56	-14	-14	-14	-14	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	59	-11	-11	-11	-11	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	67	-3	-3	-3	-3	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	45	-16	-11	-10	-9	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	66	2	7	9	12	12	12	14	17	-	LB	LB	M, LB
R18	Dental Hospital_A (north) - 2 Chalmers St	71	16	16	16	16	15	15	-	-	-	LB	-	-
R19	Commercial - 18 Lee St	43	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	64	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	**76**	21	21	21	21	20	20	-	-	M, LB	M, LB	-	-
R22	Residential - 1 Randle St	53	-13	-8	-5	3	-	-	-	8	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	73	13	13	13	13	17	17	20	-	-	LB	M, LB	-
R24	Residential - 30 Chalmers St	**75**	9	14	17	25	19	19	22	30	-	LB	M, LB	AA, M, IB, LB, PC, RO, SN
R25	Residential - 34 Regent St	36	-28	-23	-21	-15	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	60	-10	-10	-10	-10	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	37	-33	-33	-33	-33	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	63	-7	-7	-7	-7	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	73	7	12	15	23	17	17	20	28	-	LB	M, LB	M, IB, LB, PC, RO, SN
R30	Commercial (Mils Gallery) - 15 Randle St	47	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	72	6	11	14	22	16	16	19	27	-	LB	LB	M, IB, LB, PC, RO, SN
R32	Commercial - 419 Elizabeth St	46	-24	-24	-24	-24	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	67	-3	-3	-3	-3	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	61	1	1	1	1	5	5	8	-	-	-	-	-
R35	Residential - 53 Regent St	58	-6	-1	1	7	-	-	6	12	-	-	-	M, LB
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	66	6	6	6	6	10	10	13	-	-	LB	LB	-
R37	Industrial (Substation) - Chalmers St	65	-10	-10	-10	-10	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	59	-5	0	2	8	-	-	7	13	-	-	-	M, LB
R39	Residential - 73 Regent St	57	-7	-2	0	6	-	-	-	11	-	-	-	M, LB
R40	Industrial – Sydney Trains, Chalmers St	59	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	56	-4	1	1	7	-	6	6	12	-	-	-	M, LB
R42	Residential - 105 Regent St	41	-23	-18	-16	-10	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	55	-5	0	0	6	-	-	-	11	-	-	-	M, LB
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	42	-28	-28	-28	-28	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	48	-12	-12	-12	-12	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	54	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	52	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	55	0	0	0	0	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	51	-13	-8	-6	0	-	-	-	-	-	-	-	-

Table C.18	Central Walk: Construction of Platform Canopy Support System to Platforms 16 to 23 and Excavation of Launch Chambers	SCN18	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	41	-29	-29	-29	-29	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	49	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	39	-31	-31	-31	-31	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	47	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	41	-29	-29	-29	-29	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	41	-29	-29	-29	-29	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	53	-17	-17	-17	-17	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	40	-21	-16	-15	-14	-	-	-	-	-	-	-	-
R09	Church - 812 George St	40	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	56	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	48	-13	-8	-7	-6	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	58	-12	-12	-12	-12	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	65	-5	-5	-5	-5	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	43	-18	-13	-12	-11	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	64	0	5	7	10	-	10	12	15	-	LB	LB	M, LB
R18	Dental Hospital_A (north) - 2 Chalmers St	70	15	15	15	15	14	14	-	-	-	LB	-	-
R19	Commercial - 18 Lee St	41	-29	-29	-29	-29	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	63	-7	-7	-7	-7	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	74	19	19	19	19	18	18	-	-	-	LB	-	-
R22	Residential - 1 Randle St	51	-15	-10	-7	1	-	-	-	6	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	71	11	11	11	11	15	15	18	-	-	LB	LB	-
R24	Residential - 30 Chalmers St	73	7	12	15	23	17	17	20	28	-	LB	M, LB	M, IB, LB, PC, RO, SN
R25	Residential - 34 Regent St	35	-29	-24	-22	-16	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	58	-12	-12	-12	-12	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	35	-35	-35	-35	-35	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	61	-9	-9	-9	-9	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	71	5	10	13	21	15	15	18	26	-	LB	LB	M, IB, LB, PC, RO, SN
R30	Commercial (Mils Gallery) - 15 Randle St	46	-24	-24	-24	-24	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	70	4	9	12	20	14	14	17	25	-	LB	LB	M, IB, LB, PC, RO, SN
R32	Commercial - 419 Elizabeth St	44	-26	-26	-26	-26	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	66	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	59	-1	-1	-1	-1	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	57	-7	-2	0	6	-	-	-	11	-	-	-	M, LB
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	64	4	4	4	4	8	8	11	-	-	-	LB	-
R37	Industrial (Substation) - Chalmers St	63	-12	-12	-12	-12	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	57	-7	-2	0	6	-	-	-	11	-	-	-	M, LB
R39	Residential - 73 Regent St	56	-8	-3	-1	5	-	-	-	10	-	-	-	M, LB
R40	Industrial – Sydney Trains, Chalmers St	58	-17	-17	-17	-17	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	55	-5	0	0	6	-	-	-	11	-	-	-	M, LB
R42	Residential - 105 Regent St	39	-25	-20	-18	-12	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	54	-6	-1	-1	5	-	-	-	10	-	-	-	M, LB
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	41	-29	-29	-29	-29	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	54	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	47	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	52	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	51	-14	-14	-14	-14	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	53	-2	-2	-2	-2	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	50	-14	-9	-7	-1	-	-	-	-	-	-	-	-

Table C.19	Central Walk: Platform works including works below the top slab	SCN19	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	29	-41	-41	-41	-41	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	37	-33	-33	-33	-33	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	27	-43	-43	-43	-43	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	36	-34	-34	-34	-34	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	29	-41	-41	-41	-41	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	29	-41	-41	-41	-41	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	42	-28	-28	-28	-28	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	28	-33	-28	-27	-26	-	-	-	-	-	-	-	-
R09	Church - 812 George St	29	-26	-26	-26	-26	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	44	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	44	-26	-26	-26	-26	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	36	-25	-20	-19	-18	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	44	-26	-26	-26	-26	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	47	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	54	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	31	-30	-25	-24	-23	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	53	-11	-6	-4	-1	-	-	-	-	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	58	3	3	3	3	2	2	-	-	-	-	-	-
R19	Commercial - 18 Lee St	29	-41	-41	-41	-41	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	52	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	63	8	8	8	8	7	7	-	-	-	-	-	-
R22	Residential - 1 Randle St	39	-27	-22	-19	-11	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	60	0	0	0	0	-	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	62	-4	1	4	12	-	6	9	17	-	-	-	M, LB
R25	Residential - 34 Regent St	23	-41	-36	-34	-28	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	47	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	24	-46	-46	-46	-46	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	50	-20	-20	-20	-20	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	60	-6	-1	2	10	-	-	7	15	-	-	-	M, LB
R30	Commercial (Mils Gallery) - 15 Randle St	34	-36	-36	-36	-36	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	59	-7	-2	1	9	-	-	6	14	-	-	-	M, LB
R32	Commercial - 419 Elizabeth St	33	-37	-37	-37	-37	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	48	-12	-12	-12	-12	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	46	-18	-13	-11	-5	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	53	-7	-7	-7	-7	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	52	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	46	-18	-13	-11	-5	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	45	-19	-14	-12	-6	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	47	-28	-28	-28	-28	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	44	-16	-11	-11	-5	-	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	28	-36	-31	-29	-23	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	43	-17	-12	-12	-6	-	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	29	-41	-41	-41	-41	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	43	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	35	-25	-25	-25	-25	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	41	-29	-29	-29	-29	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	40	-25	-25	-25	-25	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	42	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	38	-26	-21	-19	-13	-	-	-	-	-	-	-	-

Table C.20	Central Walk: Platform Remodelling works including platform canopy modifications	SCN20	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	39	-31	-31	-31	-31	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	47	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	37	-33	-33	-33	-33	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	46	-24	-24	-24	-24	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	39	-31	-31	-31	-31	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	39	-31	-31	-31	-31	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	52	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	38	-23	-18	-17	-16	-	-	-	-	-	-	-	-
R09	Church - 812 George St	39	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	54	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	53	-17	-17	-17	-17	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	46	-15	-10	-9	-8	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	54	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	57	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	64	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	41	-20	-15	-14	-13	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	63	-1	4	6	9	-	9	11	14	-	-	LB	M, LB
R18	Dental Hospital_A (north) - 2 Chalmers St	68	13	13	13	13	12	12	-	-	-	LB	-	-
R19	Commercial - 18 Lee St	39	-31	-31	-31	-31	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	61	-9	-9	-9	-9	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	73	18	18	18	18	17	17	-	-	-	LB	-	-
R22	Residential - 1 Randle St	49	-17	-12	-9	-1	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	70	10	10	10	10	14	14	17	-	-	LB	LB	-
R24	Residential - 30 Chalmers St	72	6	11	14	22	16	16	19	27	-	LB	LB	M, IB, LB, PC, RO, SN
R25	Residential - 34 Regent St	33	-31	-26	-24	-18	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	57	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	34	-36	-36	-36	-36	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	60	-10	-10	-10	-10	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	70	4	9	12	20	14	14	17	25	-	LB	LB	M, IB, LB, PC, RO, SN
R30	Commercial (Mils Gallery) - 15 Randle St	44	-26	-26	-26	-26	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	69	3	8	11	19	13	13	16	24	-	LB	LB	M, IB, LB, PC, RO, SN
R32	Commercial - 419 Elizabeth St	43	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	65	-5	-5	-5	-5	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	58	-2	-2	-2	-2	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	56	-8	-3	-1	5	-	-	-	10	-	-	-	M, LB
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	63	3	3	3	3	7	7	10	-	-	-	LB	-
R37	Industrial (Substation) - Chalmers St	62	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	56	-8	-3	-1	5	-	-	-	10	-	-	-	M, LB
R39	Residential - 73 Regent St	54	-10	-5	-3	3	-	-	-	8	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	56	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	54	-6	-1	-1	5	-	-	-	10	-	-	-	M, LB
R42	Residential - 105 Regent St	37	-27	-22	-20	-14	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	53	-7	-2	-2	4	-	-	-	9	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	39	-31	-31	-31	-31	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	52	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	45	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	51	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	50	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	52	-3	-3	-3	-3	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	48	-16	-11	-9	-3	-	-	-	-	-	-	-	-

Table C.21	ESR: Construction of Shaft to ESR Ghost Platform	SCN21	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	41	-29	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	49	-21	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	39	-31	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	47	-23	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	41	-29	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	42	-28	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	53	-17	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	40	-21	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	41	-14	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	56	-4	-	-	-	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	55	-15	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	48	-13	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	55	-15	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	58	-12	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	66	-4	-	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	44	-17	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	64	0	-	-	-	-	-	-	-	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	70	15	-	-	-	14	-	-	-	-	-	-	-
R19	Commercial - 18 Lee St	42	-28	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	63	-7	-	-	-	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	**75**	20	-	-	-	19	-	-	-	-	-	-	-
R22	Residential - 1 Randle St	52	-14	-	-	-	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	72	12	-	-	-	16	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	74	8	-	-	-	18	-	-	-	-	-	-	-
R25	Residential - 34 Regent St	35	-29	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	58	-12	-	-	-	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	36	-34	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	62	-8	-	-	-	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	71	5	-	-	-	15	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	45	-25	-	-	-	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	70	4	-	-	-	14	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	45	-25	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	66	-4	-	-	-	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	60	0	-	-	-	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	57	-7	-	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	65	5	-	-	-	9	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	64	-11	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	57	-7	-	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	56	-8	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	58	-17	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	55	-5	-	-	-	-	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	40	-24	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	54	-6	-	-	-	-	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	41	-29	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	54	-16	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	46	-14	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	52	-18	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	51	-14	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	54	-1	-	-	-	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	50	-14	-	-	-	-	-	-	-	-	-	-	-

Table C.22	ESR: Surface Works and Underground works	SCN22	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	39	-31	-31	-31	-31	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	47	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	37	-33	-33	-33	-33	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	45	-25	-25	-25	-25	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	39	-31	-31	-31	-31	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	40	-30	-30	-30	-30	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	51	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	38	-23	-18	-17	-16	-	-	-	-	-	-	-	-
R09	Church - 812 George St	39	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	54	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	53	-17	-17	-17	-17	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	46	-15	-10	-9	-8	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	53	-17	-17	-17	-17	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	56	-14	-14	-14	-14	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	64	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	42	-19	-14	-13	-12	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	62	-2	3	5	8	-	8	10	13	-	-	LB	M, LB
R18	Dental Hospital_A (north) - 2 Chalmers St	68	13	13	13	13	12	12	-	-	-	LB	-	-
R19	Commercial - 18 Lee St	40	-30	-30	-30	-30	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	61	-9	-9	-9	-9	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	73	18	18	18	18	17	17	-	-	-	LB	-	-
R22	Residential - 1 Randle St	50	-16	-11	-8	0	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	70	10	10	10	10	14	14	17	-	-	LB	LB	-
R24	Residential - 30 Chalmers St	72	6	11	14	22	16	16	19	27	-	LB	LB	M, IB, LB, PC, RO, SN
R25	Residential - 34 Regent St	33	-31	-26	-24	-18	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	56	-14	-14	-14	-14	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	34	-36	-36	-36	-36	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	60	-10	-10	-10	-10	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	69	3	8	11	19	13	13	16	24	-	LB	LB	M, IB, LB, PC, RO, SN
R30	Commercial (Mils Gallery) - 15 Randle St	43	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	68	2	7	10	18	12	12	15	23	-	LB	LB	M, IB, LB, PC, RO, SN
R32	Commercial - 419 Elizabeth St	43	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	64	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	58	-2	-2	-2	-2	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	55	-9	-4	-2	4	-	-	-	9	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	63	3	3	3	3	7	7	10	-	-	-	LB	-
R37	Industrial (Substation) - Chalmers St	62	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	55	-9	-4	-2	4	-	-	-	9	-	-	-	-
R39	Residential - 73 Regent St	54	-10	-5	-3	3	-	-	-	8	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	56	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	53	-7	-2	-2	4	-	-	-	9	-	-	-	-
R42	Residential - 105 Regent St	38	-26	-21	-19	-13	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	52	-8	-3	-3	3	-	-	-	8	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	39	-31	-31	-31	-31	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	52	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	44	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	50	-20	-20	-20	-20	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	49	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	52	-3	-3	-3	-3	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	48	-16	-11	-9	-3	-	-	-	-	-	-	-	-

Table C.23	East Entrance: Demolition of the Bounce Hotel	SCN23	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	57	-13	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	57	-13	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	49	-21	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	55	-15	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	47	-23	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	48	-22	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	56	-14	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	49	-12	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	46	-9	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	68	8	-	-	-	17	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	54	-16	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	57	-4	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	48	-22	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	47	-23	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	62	-8	-	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	50	-11	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	71	7	-	-	-	17	-	-	-	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	67	12	-	-	-	11	-	-	-	-	-	-	-
R19	Commercial - 18 Lee St	46	-24	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	70	0	-	-	-	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	**89**	34	-	-	-	33	-	-	-	M, LB	-	-	-
R22	Residential - 1 Randle St	**90**	24	-	-	-	34	-	-	-	M, LB	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	**98**	38	-	-	-	42	-	-	-	M, LB	-	-	-
R24	Residential - 30 Chalmers St	**88**	22	-	-	-	32	-	-	-	M, LB	-	-	-
R25	Residential - 34 Regent St	44	-20	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	**93**	23	-	-	-	37	-	-	-	M, LB	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	45	-25	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	69	-1	-	-	-	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	66	0	-	-	-	-	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	**82**	12	-	-	-	26	-	-	-	M, LB	-	-	-
R31	Residential - 46 Chalmers St	59	-7	-	-	-	-	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	62	-8	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	58	-12	-	-	-	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	70	10	-	-	-	14	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	65	1	-	-	-	11	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	55	-5	-	-	-	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	56	-19	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	64	0	-	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	63	-1	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	56	-19	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	61	1	-	-	-	11	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	43	-21	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	60	0	-	-	-	-	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	48	-22	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	55	-15	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	54	-6	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	59	-11	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	52	-13	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	53	-2	-	-	-	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	52	-12	-	-	-	-	-	-	-	-	-	-	-

Table C.24	East Entrance: Piling for East Entrance	SCN24	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	54	-16	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	54	-16	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	45	-25	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	52	-18	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	43	-27	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	45	-25	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	53	-17	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	45	-16	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	42	-13	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	64	4	-	-	-	13	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	51	-19	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	53	-8	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	43	-27	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	44	-26	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	51	-19	-	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	47	-14	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	68	4	-	-	-	14	-	-	-	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	64	9	-	-	-	8	-	-	-	-	-	-	-
R19	Commercial - 18 Lee St	43	-27	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	67	-3	-	-	-	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	**86**	31	-	-	-	30	-	-	-	M, LB	-	-	-
R22	Residential - 1 Randle St	**87**	21	-	-	-	31	-	-	-	M, LB	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	**95**	35	-	-	-	39	-	-	-	M, LB	-	-	-
R24	Residential - 30 Chalmers St	**85**	19	-	-	-	29	-	-	-	M, LB	-	-	-
R25	Residential - 34 Regent St	41	-23	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	**90**	20	-	-	-	34	-	-	-	M, LB	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	41	-29	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	65	-5	-	-	-	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	63	-3	-	-	-	-	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	**79**	9	-	-	-	23	-	-	-	M, LB	-	-	-
R31	Residential - 46 Chalmers St	56	-10	-	-	-	-	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	59	-11	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	55	-15	-	-	-	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	67	7	-	-	-	11	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	62	-2	-	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	52	-8	-	-	-	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	53	-22	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	61	-3	-	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	60	-4	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	53	-22	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	58	-2	-	-	-	-	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	40	-24	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	57	-3	-	-	-	-	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	44	-26	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	52	-18	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	51	-9	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	56	-14	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	49	-16	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	50	-5	-	-	-	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	49	-15	-	-	-	-	-	-	-	-	-	-	-

Table C.25	East Entrance: Excavation of East Entrance	SCN25	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	49	-21	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	49	-21	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	41	-29	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	48	-22	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	39	-31	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	41	-29	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	49	-21	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	41	-20	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	38	-17	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	61	1	-	-	-	10	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	46	-24	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	49	-12	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	45	-25	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	40	-30	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	59	-11	-	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	43	-18	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	64	0	-	-	-	-	-	-	-	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	60	5	-	-	-	4	-	-	-	-	-	-	-
R19	Commercial - 18 Lee St	38	-32	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	63	-7	-	-	-	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	**82**	27	-	-	-	26	-	-	-	M, LB	-	-	-
R22	Residential - 1 Randle St	**83**	17	-	-	-	27	-	-	-	M, LB	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	**91**	31	-	-	-	35	-	-	-	M, LB	-	-	-
R24	Residential - 30 Chalmers St	**81**	15	-	-	-	25	-	-	-	M, LB	-	-	-
R25	Residential - 34 Regent St	37	-27	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	**86**	16	-	-	-	30	-	-	-	M, LB	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	37	-33	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	61	-9	-	-	-	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	59	-7	-	-	-	-	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	**75**	5	-	-	-	19	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	51	-15	-	-	-	-	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	54	-16	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	50	-20	-	-	-	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	63	3	-	-	-	7	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	58	-6	-	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	48	-12	-	-	-	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	48	-27	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	57	-7	-	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	56	-8	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	49	-26	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	53	-7	-	-	-	-	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	36	-28	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	53	-7	-	-	-	-	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	39	-31	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	47	-23	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	46	-14	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	51	-19	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	44	-21	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	46	-9	-	-	-	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	44	-20	-	-	-	-	-	-	-	-	-	-	-

Table C.26	East Entrance: Excavation of Adit to ESR Concourse including Canopy Tube installation	SCN26	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	50	-20	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	50	-20	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	42	-28	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	49	-21	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	40	-30	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	42	-28	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	50	-20	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	42	-19	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	39	-16	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	61	1	-	-	-	10	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	47	-23	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	50	-11	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	40	-30	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	41	-29	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	60	-10	-	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	44	-17	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	65	1	-	-	-	11	-	-	-	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	61	6	-	-	-	5	-	-	-	-	-	-	-
R19	Commercial - 18 Lee St	40	-30	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	64	-6	-	-	-	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	**82**	27	-	-	-	26	-	-	-	M, LB	-	-	-
R22	Residential - 1 Randle St	**84**	18	-	-	-	28	-	-	-	M, LB	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	**92**	32	-	-	-	36	-	-	-	M, LB	-	-	-
R24	Residential - 30 Chalmers St	**82**	16	-	-	-	26	-	-	-	M, LB	-	-	-
R25	Residential - 34 Regent St	38	-26	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	**87**	17	-	-	-	31	-	-	-	M, LB	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	38	-32	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	62	-8	-	-	-	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	60	-6	-	-	-	-	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	**76**	6	-	-	-	20	-	-	-	M, LB	-	-	-
R31	Residential - 46 Chalmers St	53	-13	-	-	-	-	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	55	-15	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	52	-18	-	-	-	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	64	4	-	-	-	8	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	58	-6	-	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	49	-11	-	-	-	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	50	-25	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	57	-7	-	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	57	-7	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	50	-25	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	54	-6	-	-	-	-	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	37	-27	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	54	-6	-	-	-	-	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	41	-29	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	48	-22	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	47	-13	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	52	-18	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	45	-20	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	47	-8	-	-	-	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	45	-19	-	-	-	-	-	-	-	-	-	-	-

Table C.27	East Entrance: FRP works to East Entrance	SCN27	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	44	-26	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	43	-27	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	36	-34	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	41	-29	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	35	-35	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	36	-34	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	42	-28	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	38	-23	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	34	-21	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	53	-7	-	-	-	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	40	-30	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	45	-16	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	33	-37	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	34	-36	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	43	-27	-	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	39	-22	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	60	-4	-	-	-	-	-	-	-	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	52	-3	-	-	-	-	-	-	-	-	-	-	-
R19	Commercial - 18 Lee St	35	-35	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	59	-11	-	-	-	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	**76**	21	-	-	-	20	-	-	-	M, LB	-	-	-
R22	Residential - 1 Randle St	**78**	12	-	-	-	22	-	-	-	M, LB	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	**87**	27	-	-	-	31	-	-	-	M, LB	-	-	-
R24	Residential - 30 Chalmers St	**80**	14	-	-	-	24	-	-	-	M, LB	-	-	-
R25	Residential - 34 Regent St	33	-31	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	**83**	13	-	-	-	27	-	-	-	M, LB	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	34	-36	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	58	-12	-	-	-	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	55	-11	-	-	-	-	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	73	3	-	-	-	17	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	48	-18	-	-	-	-	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	51	-19	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	48	-22	-	-	-	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	59	-1	-	-	-	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	54	-10	-	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	45	-15	-	-	-	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	46	-29	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	53	-11	-	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	53	-11	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	45	-30	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	51	-9	-	-	-	-	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	33	-31	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	50	-10	-	-	-	-	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	38	-32	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	44	-26	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	44	-16	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	48	-22	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	41	-24	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	42	-13	-	-	-	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	42	-22	-	-	-	-	-	-	-	-	-	-	-

Table C.28	East Entrance: East Entrance Works and Underground Works	SCN28	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	46	-24	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	47	-23	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	39	-31	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	45	-25	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	36	-34	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	37	-33	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	46	-24	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	38	-23	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	34	-21	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	58	-2	-	-	-	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	44	-26	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	45	-16	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	35	-35	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	35	-35	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	54	-16	-	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	39	-22	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	60	-4	-	-	-	-	-	-	-	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	56	1	-	-	-	0	-	-	-	-	-	-	-
R19	Commercial - 18 Lee St	35	-35	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	59	-11	-	-	-	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	**81**	26	-	-	-	25	-	-	-	M, LB	-	-	-
R22	Residential - 1 Randle St	**81**	15	-	-	-	25	-	-	-	M, LB	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	**87**	27	-	-	-	31	-	-	-	M, LB	-	-	-
R24	Residential - 30 Chalmers St	**75**	9	-	-	-	19	-	-	-	-	-	-	-
R25	Residential - 34 Regent St	33	-31	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	**81**	11	-	-	-	25	-	-	-	M, LB	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	34	-36	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	57	-13	-	-	-	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	54	-12	-	-	-	-	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	69	-1	-	-	-	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	48	-18	-	-	-	-	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	51	-19	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	46	-24	-	-	-	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	59	-1	-	-	-	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	53	-11	-	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	45	-15	-	-	-	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	43	-32	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	52	-12	-	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	51	-13	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	41	-34	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	47	-13	-	-	-	-	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	31	-33	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	47	-13	-	-	-	-	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	36	-34	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	39	-31	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	40	-20	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	44	-26	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	36	-29	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	39	-16	-	-	-	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	37	-27	-	-	-	-	-	-	-	-	-	-	-

Table C.29	Grand Concourse: Piling in Grand Concourse	SCN29	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	45	-25	-25	-25	-25	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	44	-26	-26	-26	-26	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	43	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	43	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	48	-22	-22	-22	-22	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	50	-20	-20	-20	-20	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	44	-26	-26	-26	-26	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	52	-9	-4	-3	-2	-	-	-	-	-	-	-	-
R09	Church - 812 George St	51	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	52	-8	-8	-8	-8	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	48	-22	-22	-22	-22	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	53	-8	-3	-2	-1	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	48	-22	-22	-22	-22	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	51	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	53	-17	-17	-17	-17	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	56	-5	0	1	2	-	-	6	7	-	-	-	-
R17	YHA Hostel - 10 Lee St	72	8	13	15	18	18	18	20	23	-	LB	M, LB	M, IB, LB, PC, RO, SN
R18	Dental Hospital_A (north) - 2 Chalmers St	64	9	9	9	9	8	8	-	-	-	-	-	-
R19	Commercial - 18 Lee St	57	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	70	0	0	0	0	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	70	15	15	15	15	14	14	-	-	-	LB	-	-
R22	Residential - 1 Randle St	46	-20	-15	-12	-4	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	56	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	69	3	8	11	19	13	13	16	24	-	LB	LB	M, IB, LB, PC, RO, SN
R25	Residential - 34 Regent St	42	-22	-17	-15	-9	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	65	-5	-5	-5	-5	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	41	-29	-29	-29	-29	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	68	-2	-2	-2	-2	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	68	2	7	10	18	12	12	15	23	-	LB	LB	M, IB, LB, PC, RO, SN
R30	Commercial (Mils Gallery) - 15 Randle St	45	-25	-25	-25	-25	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	69	3	8	11	19	13	13	16	24	-	LB	LB	M, IB, LB, PC, RO, SN
R32	Commercial - 419 Elizabeth St	47	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	69	-1	-1	-1	-1	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	56	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	43	-21	-16	-14	-8	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	66	6	6	6	6	10	10	13	-	-	LB	LB	-
R37	Industrial (Substation) - Chalmers St	68	-7	-7	-7	-7	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	45	-19	-14	-12	-6	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	45	-19	-14	-12	-6	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	65	-10	-10	-10	-10	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	55	-5	0	0	6	-	-	-	11	-	-	-	M, LB
R42	Residential - 105 Regent St	51	-13	-8	-6	0	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	60	0	5	5	11	-	10	10	16	-	LB	LB	M, LB
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	45	-25	-25	-25	-25	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	61	-9	-9	-9	-9	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	51	-9	-9	-9	-9	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	58	-7	-7	-7	-7	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	61	6	6	6	6	13	13	13	-	-	LB	LB	-
R50	Residential - 141 Regent St	56	-8	-3	-1	5	-	-	-	10	-	-	-	M, LB

Table C.30	Grand Concourse: FRP Pile caps	SCN30	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	49	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	48	-22	-22	-22	-22	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	47	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	47	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	52	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	48	-22	-22	-22	-22	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	56	-5	0	1	2	-	-	6	7	-	-	-	-
R09	Church - 812 George St	55	0	0	0	0	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	56	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	52	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	57	-4	1	2	3	-	6	7	8	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	52	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	57	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	60	-1	4	5	6	-	9	10	11	-	-	LB	M, LB
R17	YHA Hostel - 10 Lee St	**76**	12	17	19	22	22	22	24	27	M, LB	M, LB	M, LB	M, IB, LB, PC, RO, SN
R18	Dental Hospital_A (north) - 2 Chalmers St	68	13	13	13	13	12	12	-	-	-	LB	-	-
R19	Commercial - 18 Lee St	61	-9	-9	-9	-9	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	74	4	4	4	4	20	20	-	-	M, LB	M, LB	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	74	19	19	19	19	18	18	-	-	-	LB	-	-
R22	Residential - 1 Randle St	51	-15	-10	-7	1	-	-	-	6	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	60	0	0	0	0	-	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	73	7	12	15	23	17	17	20	28	-	LB	M, LB	M, IB, LB, PC, RO, SN
R25	Residential - 34 Regent St	46	-18	-13	-11	-5	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	69	-1	-1	-1	-1	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	45	-25	-25	-25	-25	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	72	2	2	2	2	18	18	-	-	-	LB	-	-
R29	Residential - 38 Chalmers St	73	7	12	15	23	17	17	20	28	-	LB	M, LB	M, IB, LB, PC, RO, SN
R30	Commercial (Mils Gallery) - 15 Randle St	50	-20	-20	-20	-20	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	73	7	12	15	23	17	17	20	28	-	LB	M, LB	M, IB, LB, PC, RO, SN
R32	Commercial - 419 Elizabeth St	51	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	74	4	4	4	4	18	18	-	-	-	LB	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	60	0	0	0	0	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	47	-17	-12	-10	-4	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	70	10	10	10	10	14	14	17	-	-	LB	LB	-
R37	Industrial (Substation) - Chalmers St	72	-3	-3	-3	-3	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	49	-15	-10	-8	-2	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	49	-15	-10	-8	-2	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	69	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	59	-1	4	4	10	-	9	9	15	-	-	-	M, LB
R42	Residential - 105 Regent St	56	-8	-3	-1	5	-	-	-	10	-	-	-	M, LB
R43	Residential - 54 Regent St	64	4	9	9	15	14	14	14	20	-	LB	LB	M, IB, LB, PC, RO, SN
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	49	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	65	-5	-5	-5	-5	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	56	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	59	-11	-11	-11	-11	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	62	-3	-3	-3	-3	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	65	10	10	10	10	17	17	17	-	-	LB	LB	-
R50	Residential - 141 Regent St	60	-4	1	3	9	-	6	8	14	-	-	-	M, LB

Table C.31	Grand Concourse: Removal of Existing Canopies	SCN31	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	32	-38	-38	-38	-38	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	31	-39	-39	-39	-39	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	30	-40	-40	-40	-40	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	30	-40	-40	-40	-40	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	35	-35	-35	-35	-35	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	37	-33	-33	-33	-33	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	31	-39	-39	-39	-39	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	39	-22	-17	-16	-15	-	-	-	-	-	-	-	-
R09	Church - 812 George St	38	-17	-17	-17	-17	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	39	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	35	-35	-35	-35	-35	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	40	-21	-16	-15	-14	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	35	-35	-35	-35	-35	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	38	-32	-32	-32	-32	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	40	-30	-30	-30	-30	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	43	-18	-13	-12	-11	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	59	-5	0	2	5	-	-	7	10	-	-	-	M, LB
R18	Dental Hospital_A (north) - 2 Chalmers St	50	-5	-5	-5	-5	-	-	-	-	-	-	-	-
R19	Commercial - 18 Lee St	44	-26	-26	-26	-26	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	57	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	57	2	2	2	2	1	1	-	-	-	-	-	-
R22	Residential - 1 Randle St	34	-32	-27	-24	-16	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	43	-17	-17	-17	-17	-	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	55	-11	-6	-3	5	-	-	-	10	-	-	-	M, LB
R25	Residential - 34 Regent St	29	-35	-30	-28	-22	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	51	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	28	-42	-42	-42	-42	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	55	-11	-6	-3	5	-	-	-	10	-	-	-	M, LB
R30	Commercial (Mils Gallery) - 15 Randle St	32	-38	-38	-38	-38	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	56	-10	-5	-2	6	-	-	-	11	-	-	-	M, LB
R32	Commercial - 419 Elizabeth St	34	-36	-36	-36	-36	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	56	-14	-14	-14	-14	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	43	-17	-17	-17	-17	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	30	-34	-29	-27	-21	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	53	-7	-7	-7	-7	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	55	-20	-20	-20	-20	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	32	-32	-27	-25	-19	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	33	-31	-26	-24	-18	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	52	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	42	-18	-13	-13	-7	-	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	38	-26	-21	-19	-13	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	47	-13	-8	-8	-2	-	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	32	-38	-38	-38	-38	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	48	-22	-22	-22	-22	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	39	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	42	-28	-28	-28	-28	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	45	-20	-20	-20	-20	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	48	-7	-7	-7	-7	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	43	-21	-16	-14	-8	-	-	-	-	-	-	-	-

Table C.32	Grand Concourse: Installation of precast / insitu columns and arches	SCN32	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	49	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	48	-22	-22	-22	-22	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	47	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	47	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	52	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	48	-22	-22	-22	-22	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	56	-5	0	1	2	-	-	6	7	-	-	-	-
R09	Church - 812 George St	55	0	0	0	0	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	56	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	52	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	57	-4	1	2	3	-	6	7	8	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	52	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	57	-13	-13	-13	-13	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	60	-1	4	5	6	-	9	10	11	-	-	LB	M, LB
R17	YHA Hostel - 10 Lee St	**76**	12	17	19	22	22	22	24	27	M, LB	M, LB	M, LB	M, IB, LB, PC, RO, SN
R18	Dental Hospital_A (north) - 2 Chalmers St	68	13	13	13	13	12	12	-	-	-	LB	-	-
R19	Commercial - 18 Lee St	61	-9	-9	-9	-9	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	74	4	4	4	4	20	20	-	-	M, LB	M, LB	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	74	19	19	19	19	18	18	-	-	-	LB	-	-
R22	Residential - 1 Randle St	51	-15	-10	-7	1	-	-	-	6	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	60	0	0	0	0	-	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	73	7	12	15	23	17	17	20	28	-	LB	M, LB	M, IB, LB, PC, RO, SN
R25	Residential - 34 Regent St	46	-18	-13	-11	-5	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	69	-1	-1	-1	-1	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	45	-25	-25	-25	-25	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	72	2	2	2	2	18	18	-	-	-	LB	-	-
R29	Residential - 38 Chalmers St	73	7	12	15	23	17	17	20	28	-	LB	M, LB	M, IB, LB, PC, RO, SN
R30	Commercial (Mils Gallery) - 15 Randle St	50	-20	-20	-20	-20	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	74	8	13	16	24	18	18	21	29	-	LB	M, LB	M, IB, LB, PC, RO, SN
R32	Commercial - 419 Elizabeth St	51	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	73	3	3	3	3	17	17	-	-	-	LB	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	60	0	0	0	0	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	47	-17	-12	-10	-4	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	70	10	10	10	10	14	14	17	-	-	LB	LB	-
R37	Industrial (Substation) - Chalmers St	72	-3	-3	-3	-3	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	49	-15	-10	-8	-2	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	49	-15	-10	-8	-2	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	69	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	59	-1	4	4	10	-	9	9	15	-	-	-	M, LB
R42	Residential - 105 Regent St	56	-8	-3	-1	5	-	-	-	10	-	-	-	M, LB
R43	Residential - 54 Regent St	64	4	9	9	15	14	14	14	20	-	LB	LB	M, IB, LB, PC, RO, SN
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	49	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	65	-5	-5	-5	-5	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	56	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	59	-11	-11	-11	-11	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	62	-3	-3	-3	-3	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	65	10	10	10	10	17	17	17	-	-	LB	LB	-
R50	Residential - 141 Regent St	60	-4	1	3	9	-	6	8	14	-	-	-	M, LB

Table C.33	Grand Concourse: Installation of Roof Structure	SCN33	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	30	-40	-40	-40	-40	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	29	-41	-41	-41	-41	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	29	-41	-41	-41	-41	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	29	-41	-41	-41	-41	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	33	-37	-37	-37	-37	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	36	-34	-34	-34	-34	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	30	-40	-40	-40	-40	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	38	-23	-18	-17	-16	-	-	-	-	-	-	-	-
R09	Church - 812 George St	37	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	37	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	33	-37	-37	-37	-37	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	38	-23	-18	-17	-16	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	34	-36	-36	-36	-36	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	37	-33	-33	-33	-33	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	38	-32	-32	-32	-32	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	41	-20	-15	-14	-13	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	56	-8	-3	-1	2	-	-	-	7	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	48	-7	-7	-7	-7	-	-	-	-	-	-	-	-
R19	Commercial - 18 Lee St	42	-28	-28	-28	-28	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	55	0	0	0	0	-	-	-	-	-	-	-	-
R22	Residential - 1 Randle St	32	-34	-29	-26	-18	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	42	-18	-18	-18	-18	-	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	53	-13	-8	-5	3	-	-	-	8	-	-	-	-
R25	Residential - 34 Regent St	28	-36	-31	-29	-23	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	49	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	26	-44	-44	-44	-44	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	53	-17	-17	-17	-17	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	53	-13	-8	-5	3	-	-	-	8	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	30	-40	-40	-40	-40	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	54	-12	-7	-4	4	-	-	-	9	-	-	-	-
R32	Commercial - 419 Elizabeth St	33	-37	-37	-37	-37	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	54	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	41	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	28	-36	-31	-29	-23	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	51	-9	-9	-9	-9	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	52	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	31	-33	-28	-26	-20	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	31	-33	-28	-26	-20	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	50	-25	-25	-25	-25	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	40	-20	-15	-15	-9	-	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	36	-28	-23	-21	-15	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	44	-16	-11	-11	-5	-	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	31	-39	-39	-39	-39	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	46	-24	-24	-24	-24	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	37	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	40	-30	-30	-30	-30	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	43	-22	-22	-22	-22	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	45	-10	-10	-10	-10	-	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	40	-24	-19	-17	-11	-	-	-	-	-	-	-	-

Table C.34	Northern Concourse & North Entry: Demolition Southern Half	SCN34	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	45	-25	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	47	-23	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	44	-26	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	55	-15	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	47	-23	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	50	-20	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	52	-18	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	52	-9	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	51	-4	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	61	1	-	-	-	10	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	61	-9	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	58	-3	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	58	-12	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	61	-9	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	67	-3	-	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	54	-7	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	74	10	-	-	-	20	-	-	-	M, LB	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	**77**	22	-	-	-	21	-	-	-	M, LB	-	-	-
R19	Commercial - 18 Lee St	58	-12	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	72	2	-	-	-	18	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	**76**	21	-	-	-	20	-	-	-	M, LB	-	-	-
R22	Residential - 1 Randle St	51	-15	-	-	-	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	67	7	-	-	-	11	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	74	8	-	-	-	18	-	-	-	-	-	-	-
R25	Residential - 34 Regent St	43	-21	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	70	0	-	-	-	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	42	-28	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	70	0	-	-	-	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	73	7	-	-	-	17	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	49	-21	-	-	-	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	74	8	-	-	-	18	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	52	-18	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	72	2	-	-	-	16	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	55	-5	-	-	-	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	47	-17	-	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	70	10	-	-	-	14	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	70	-5	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	56	-8	-	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	60	-4	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	66	-9	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	61	1	-	-	-	11	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	57	-7	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	63	3	-	-	-	13	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	48	-22	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	63	-7	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	55	-5	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	59	-11	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	58	-7	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	62	7	-	-	-	14	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	57	-7	-	-	-	-	-	-	-	-	-	-	-

Table C.35	Northern Concourse & North Entry: FRP of Structure (Floor, retaining wall, Columns)	SCN35	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	46	-24	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	49	-21	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	46	-24	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	57	-13	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	49	-21	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	52	-18	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	54	-16	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	54	-7	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	52	-3	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	63	3	-	-	-	12	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	63	-7	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	60	-1	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	60	-10	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	63	-7	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	69	-1	-	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	56	-5	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	**76**	12	-	-	-	22	-	-	-	M, LB	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	**79**	24	-	-	-	23	-	-	-	M, LB	-	-	-
R19	Commercial - 18 Lee St	60	-10	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	74	4	-	-	-	20	-	-	-	M, LB	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	**79**	24	-	-	-	23	-	-	-	M, LB	-	-	-
R22	Residential - 1 Randle St	53	-13	-	-	-	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	69	9	-	-	-	13	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	**76**	10	-	-	-	20	-	-	-	M, LB	-	-	-
R25	Residential - 34 Regent St	44	-20	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	73	3	-	-	-	17	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	44	-26	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	72	2	-	-	-	18	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	**75**	9	-	-	-	19	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	51	-19	-	-	-	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	**76**	10	-	-	-	20	-	-	-	M, LB	-	-	-
R32	Commercial - 419 Elizabeth St	54	-16	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	74	4	-	-	-	18	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	57	-3	-	-	-	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	49	-15	-	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	72	12	-	-	-	16	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	73	-2	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	58	-6	-	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	62	-2	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	69	-6	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	63	3	-	-	-	13	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	59	-5	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	65	5	-	-	-	15	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	50	-20	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	65	-5	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	57	-3	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	62	-8	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	60	-5	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	64	9	-	-	-	16	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	59	-5	-	-	-	-	-	-	-	-	-	-	-

Table C.36	Northern Concourse & North Entry: Demolition Northern Half	SCN36	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	45	-25	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	47	-23	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	44	-26	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	55	-15	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	47	-23	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	50	-20	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	52	-18	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	52	-9	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	51	-4	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	61	1	-	-	-	10	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	61	-9	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	58	-3	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	58	-12	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	61	-9	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	67	-3	-	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	54	-7	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	74	10	-	-	-	20	-	-	-	M, LB	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	**77**	22	-	-	-	21	-	-	-	M, LB	-	-	-
R19	Commercial - 18 Lee St	58	-12	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	72	2	-	-	-	18	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	**76**	21	-	-	-	20	-	-	-	M, LB	-	-	-
R22	Residential - 1 Randle St	51	-15	-	-	-	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	67	7	-	-	-	11	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	74	8	-	-	-	18	-	-	-	-	-	-	-
R25	Residential - 34 Regent St	43	-21	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	70	0	-	-	-	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	42	-28	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	70	0	-	-	-	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	73	7	-	-	-	17	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	49	-21	-	-	-	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	74	8	-	-	-	18	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	52	-18	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	72	2	-	-	-	16	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	55	-5	-	-	-	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	47	-17	-	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	70	10	-	-	-	14	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	70	-5	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	56	-8	-	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	60	-4	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	66	-9	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	61	1	-	-	-	11	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	57	-7	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	63	3	-	-	-	13	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	48	-22	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	63	-7	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	55	-5	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	59	-11	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	58	-7	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	62	7	-	-	-	14	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	57	-7	-	-	-	-	-	-	-	-	-	-	-

Table C.37	Northern Concourse & North Entry: FRP of Structure (Floor, retaining wall, Columns)	SCN37	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	46	-24	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	49	-21	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	46	-24	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	57	-13	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	49	-21	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	52	-18	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	54	-16	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	54	-7	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	52	-3	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	63	3	-	-	-	12	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	63	-7	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	60	-1	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	60	-10	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	63	-7	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	69	-1	-	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	56	-5	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	**76**	12	-	-	-	22	-	-	-	M, LB	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	**79**	24	-	-	-	23	-	-	-	M, LB	-	-	-
R19	Commercial - 18 Lee St	60	-10	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	74	4	-	-	-	20	-	-	-	M, LB	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	**79**	24	-	-	-	23	-	-	-	M, LB	-	-	-
R22	Residential - 1 Randle St	53	-13	-	-	-	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	69	9	-	-	-	13	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	**76**	10	-	-	-	20	-	-	-	M, LB	-	-	-
R25	Residential - 34 Regent St	44	-20	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	73	3	-	-	-	17	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	44	-26	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	72	2	-	-	-	18	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	**75**	9	-	-	-	19	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	51	-19	-	-	-	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	**76**	10	-	-	-	20	-	-	-	M, LB	-	-	-
R32	Commercial - 419 Elizabeth St	54	-16	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	74	4	-	-	-	18	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	57	-3	-	-	-	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	49	-15	-	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	72	12	-	-	-	16	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	73	-2	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	58	-6	-	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	62	-2	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	69	-6	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	63	3	-	-	-	13	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	59	-5	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	65	5	-	-	-	15	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	50	-20	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	65	-5	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	57	-3	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	62	-8	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	60	-5	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	64	9	-	-	-	16	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	59	-5	-	-	-	-	-	-	-	-	-	-	-

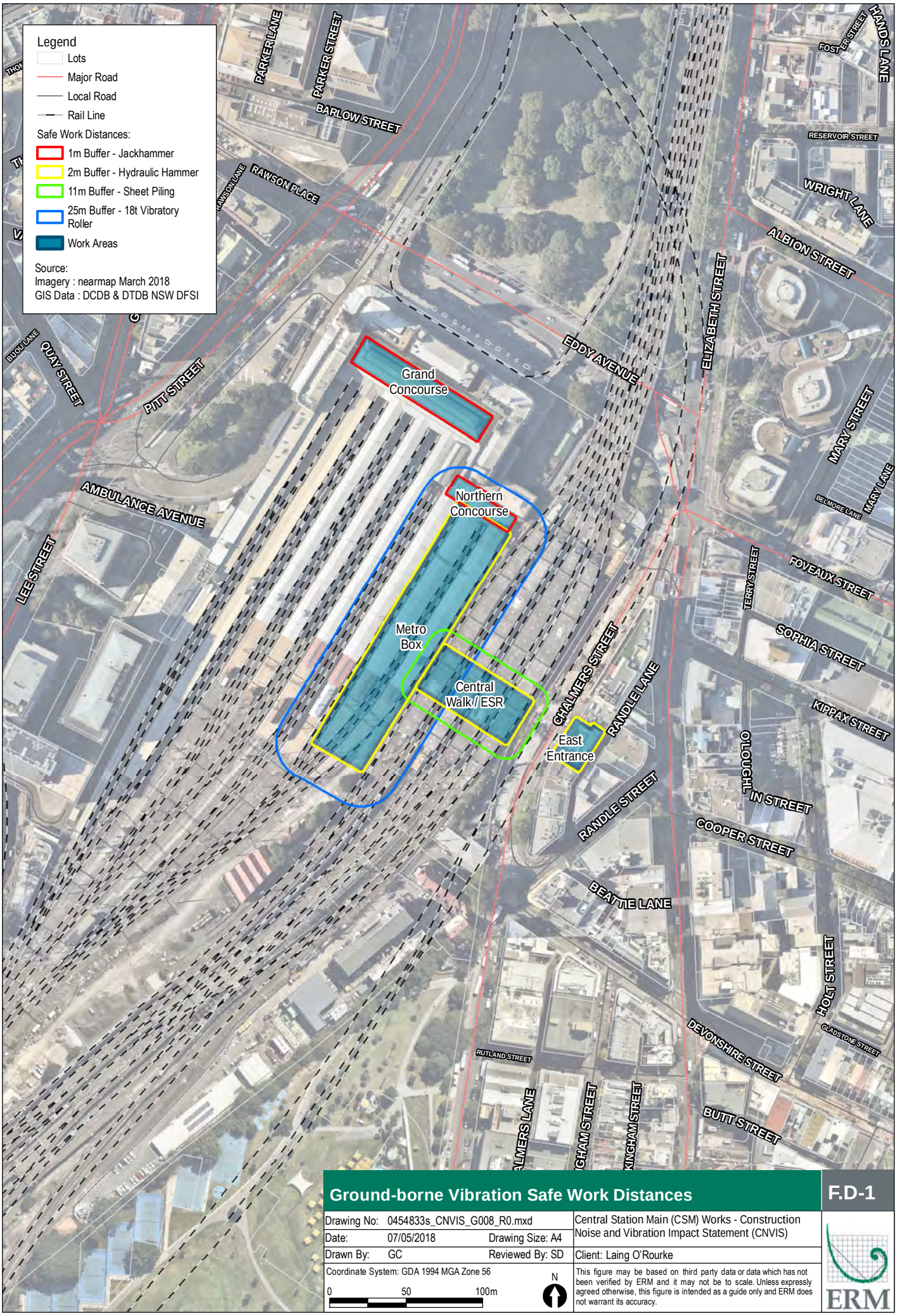
Table C.38	Northern Concourse & North Entry: Installation of remaining precast columns and Arches	SCN38	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	46	-24	-	-	-	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	48	-22	-	-	-	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	45	-25	-	-	-	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	56	-14	-	-	-	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	49	-21	-	-	-	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	51	-19	-	-	-	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	54	-16	-	-	-	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	53	-8	-	-	-	-	-	-	-	-	-	-	-
R09	Church - 812 George St	52	-3	-	-	-	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	63	3	-	-	-	12	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	62	-8	-	-	-	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	59	-2	-	-	-	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	59	-11	-	-	-	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	62	-8	-	-	-	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	69	-1	-	-	-	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	56	-5	-	-	-	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	**76**	12	-	-	-	22	-	-	-	M, LB	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	**78**	23	-	-	-	22	-	-	-	M, LB	-	-	-
R19	Commercial - 18 Lee St	59	-11	-	-	-	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	73	3	-	-	-	19	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	**78**	23	-	-	-	22	-	-	-	M, LB	-	-	-
R22	Residential - 1 Randle St	52	-14	-	-	-	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	68	8	-	-	-	12	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	**76**	10	-	-	-	20	-	-	-	M, LB	-	-	-
R25	Residential - 34 Regent St	44	-20	-	-	-	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	72	2	-	-	-	16	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	44	-26	-	-	-	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	72	2	-	-	-	18	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	**75**	9	-	-	-	19	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	50	-20	-	-	-	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	**75**	9	-	-	-	19	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	53	-17	-	-	-	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	73	3	-	-	-	17	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	57	-3	-	-	-	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	48	-16	-	-	-	-	-	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	71	11	-	-	-	15	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	72	-3	-	-	-	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	57	-7	-	-	-	-	-	-	-	-	-	-	-
R39	Residential - 73 Regent St	61	-3	-	-	-	-	-	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	68	-7	-	-	-	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	62	2	-	-	-	12	-	-	-	-	-	-	-
R42	Residential - 105 Regent St	58	-6	-	-	-	-	-	-	-	-	-	-	-
R43	Residential - 54 Regent St	64	4	-	-	-	14	-	-	-	-	-	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	49	-21	-	-	-	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	64	-6	-	-	-	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	56	-4	-	-	-	-	-	-	-	-	-	-	-
R47	Commercial - 70 Regent St	61	-9	-	-	-	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	59	-6	-	-	-	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	64	9	-	-	-	16	-	-	-	-	-	-	-
R50	Residential - 141 Regent St	59	-5	-	-	-	-	-	-	-	-	-	-	-

Table C.39	Sydney Yard Access Bridge: Heavy Vehicle Traffic on the SYAB	SCN39	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	37	-33	-33	-33	-33	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	38	-32	-32	-32	-32	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	33	-37	-37	-37	-37	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	38	-32	-32	-32	-32	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	37	-33	-33	-33	-33	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	38	-32	-32	-32	-32	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	34	-36	-36	-36	-36	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	36	-25	-20	-19	-18	-	-	-	-	-	-	-	-
R09	Church - 812 George St	32	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	38	-22	-22	-22	-22	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth S	41	-29	-29	-29	-29	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	29	-32	-27	-26	-25	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	43	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	43	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	49	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	30	-31	-26	-25	-24	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	52	-12	-7	-5	-2	-	-	-	-	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	50	-5	-5	-5	-5	-	-	-	-	-	-	-	-
R19	Commercial - 18 Lee St	28	-42	-42	-42	-42	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	55	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	49	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R22	Residential - 1 Randle St	37	-29	-24	-21	-13	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	44	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	49	-17	-12	-9	-1	-	-	-	-	-	-	-	-
R25	Residential - 34 Regent St	57	-7	-2	0	6	-	-	-	11	-	-	-	M, LB
R26	Commercial (Various) - 11 Randle St	46	-24	-24	-24	-24	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	59	-11	-11	-11	-11	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	58	-12	-12	-12	-12	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	46	-20	-15	-12	-4	-	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	27	-43	-43	-43	-43	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	45	-21	-16	-13	-5	-	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	45	-25	-25	-25	-25	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	54	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	45	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	60	-4	1	3	9	-	6	8	14	-	-	-	M, LB
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers S	44	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	56	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	61	-3	2	4	10	-	7	9	15	-	-	-	M, LB
R39	Residential - 73 Regent St	61	-3	2	4	10	-	7	9	15	-	-	-	M, LB
R40	Industrial – Sydney Trains, Chalmers St	60	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	68	8	13	13	19	18	18	18	24	-	LB	LB	M, IB, LB, PC, RO, SN
R42	Residential - 105 Regent St	62	-2	3	5	11	-	8	10	16	-	-	LB	M, LB
R43	Residential - 54 Regent St	71	11	16	16	22	21	21	21	27	M, LB	M, LB	M, LB	M, IB, LB, PC, RO, SN
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	68	-2	-2	-2	-2	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	64	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	65	5	5	5	5	11	11	13	-	-	LB	LB	-
R47	Commercial - 70 Regent St	67	-3	-3	-3	-3	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	61	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	62	7	7	7	7	14	14	14	-	-	LB	LB	-
R50	Residential - 141 Regent St	58	-6	-1	1	7	-	-	6	12	-	-	-	M, LB

Table C.39	Sydney Yard Access Bridge: Heavy Vehicle Traffic on the SYAB	SCN39B	Comparison to NML				If NML Exceeded - Comparison to RBL				Mitigation / Management (AMMM)			
Location ID	Description	Predicted Noise Level	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night	Day Standard	Day Non-Standard	Evening	Night
R01	Commercial - 138 Hay St	40	-33	-33	-33	-33	-	-	-	-	-	-	-	-
R02	Commercial - 323 Castlereagh St	41	-32	-32	-32	-32	-	-	-	-	-	-	-	-
R03	Commercial - 467 Pitt St	36	-37	-37	-37	-37	-	-	-	-	-	-	-	-
R04	Commercial - 228 Elizabeth St	41	-32	-32	-32	-32	-	-	-	-	-	-	-	-
R05	Commercial - 477 Pitt St	40	-33	-33	-33	-33	-	-	-	-	-	-	-	-
R06	Commercial - 24 Rawson Pl	41	-32	-32	-32	-32	-	-	-	-	-	-	-	-
R07	Commercial - 242 Elizabeth St	37	-36	-36	-36	-36	-	-	-	-	-	-	-	-
R08	YHA Hostel - 11 Rawson Pl	39	-25	-20	-19	-18	-	-	-	-	-	-	-	-
R09	Church - 812 George St	35	-23	-23	-23	-23	-	-	-	-	-	-	-	-
R10	Recreational - Belmore Park	41	-22	-22	-22	-22	-	-	-	-	-	-	-	-
R11	Commercial (China Investment Corporation) - 250 Elizabeth St	44	-29	-29	-29	-29	-	-	-	-	-	-	-	-
R12	Hostel (Wake up Sydney) - 509 Pitt St	32	-32	-27	-26	-25	-	-	-	-	-	-	-	-
R13	Commercial (Various) - 280 Elizabeth St	46	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R14	Commercial (Various) - 300 Elizabeth St	46	-27	-27	-27	-27	-	-	-	-	-	-	-	-
R15	Commercial (Retail; Woolworths) - 302 Elizabeth St	52	-21	-21	-21	-21	-	-	-	-	-	-	-	-
R16	Adina Hotel - 2 Lee St	33	-31	-26	-25	-24	-	-	-	-	-	-	-	-
R17	YHA Hostel - 10 Lee St	55	-12	-7	-5	-2	-	-	-	-	-	-	-	-
R18	Dental Hospital_A (north) - 2 Chalmers St	53	-5	-5	-5	-5	-	-	-	-	-	-	-	-
R19	Commercial - 18 Lee St	31	-42	-42	-42	-42	-	-	-	-	-	-	-	-
R20	Commercial - 14 Lee St	58	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R21	Dental Hospital_B (south) - 2 Chalmers St	52	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R22	Residential - 1 Randle St	40	-29	-24	-21	-13	-	-	-	-	-	-	-	-
R23	Commercial (Bar; Ding Dong Dang) - 7 Randle St	47	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R24	Residential - 30 Chalmers St	52	-17	-12	-9	-1	-	-	-	-	-	-	-	-
R25	Residential - 34 Regent St	60	-7	-2	0	6	-	-	-	-	-	-	-	-
R26	Commercial (Various) - 11 Randle St	49	-24	-24	-24	-24	-	-	-	-	-	-	-	-
R27	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	62	-11	-11	-11	-11	-	-	-	-	-	-	-	-
R28	Commercial (Offices; Dept. of Foreign Affairs) - 26 Lee St	61	-12	-12	-12	-12	-	-	-	-	-	-	-	-
R29	Residential - 38 Chalmers St	49	-20	-15	-12	-4	-	-	-	-	-	-	-	-
R30	Commercial (Mils Gallery) - 15 Randle St	30	-43	-43	-43	-43	-	-	-	-	-	-	-	-
R31	Residential - 46 Chalmers St	48	-21	-16	-13	-5	-	-	-	-	-	-	-	-
R32	Commercial - 419 Elizabeth St	48	-25	-25	-25	-25	-	-	-	-	-	-	-	-
R33	Commercial (Retail; Interface Australia HQ) - 101 Chalmers St	57	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R34	Commercial (Bar; Madison Hotel) - 52 Devonshire St	48	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R35	Residential - 53 Regent St	63	-4	1	3	9	-	6	-	-	-	-	-	-
R36	Commercial (Bar; Royal Exhibition Hotel) - 88 Chalmers St	47	-16	-16	-16	-16	-	-	-	-	-	-	-	-
R37	Industrial (Substation) - Chalmers St	59	-19	-19	-19	-19	-	-	-	-	-	-	-	-
R38	Residential - 65 Regent St	64	-3	2	4	10	-	7	-	-	-	-	-	-
R39	Residential - 73 Regent St	64	-3	2	4	10	-	7	-	-	-	-	-	-
R40	Industrial – Sydney Trains, Chalmers St	63	-15	-15	-15	-15	-	-	-	-	-	-	-	-
R41	Residential - 52 Regent St	71	8	13	13	19	18	18	-	-	-	LB	-	-
R42	Residential - 105 Regent St	65	-2	3	5	11	-	8	-	-	-	-	-	-
R43	Residential - 54 Regent St	74	11	16	16	22	21	21	-	-	M, LB	M, LB	-	-
R44	Commercial (Retail; Café Ideas) - 88 Meagher St	71	-2	-2	-2	-2	-	-	-	-	-	-	-	-
R45	Commercial – Sydney Trains, Chalmers St	67	-6	-6	-6	-6	-	-	-	-	-	-	-	-
R46	Commercial (Bar; Lord Gladstone Hotel) - 115 Regent St	68	5	5	5	5	11	11	-	-	-	LB	-	-
R47	Commercial - 70 Regent St	70	-3	-3	-3	-3	-	-	-	-	-	-	-	-
R48	Recreational - Prince Alfred Park	64	-4	-4	-4	-4	-	-	-	-	-	-	-	-
R49	Church - 242 Cleveland St	65	7	7	7	7	14	14	-	-	-	LB	-	-
R50	Residential - 141 Regent St	61	-6	-1	1	7	-	-	-	-	-	-	-	-

Annex D

Safe Work Distance Figures



Ground-borne Vibration Safe Work Distances

F.D-1

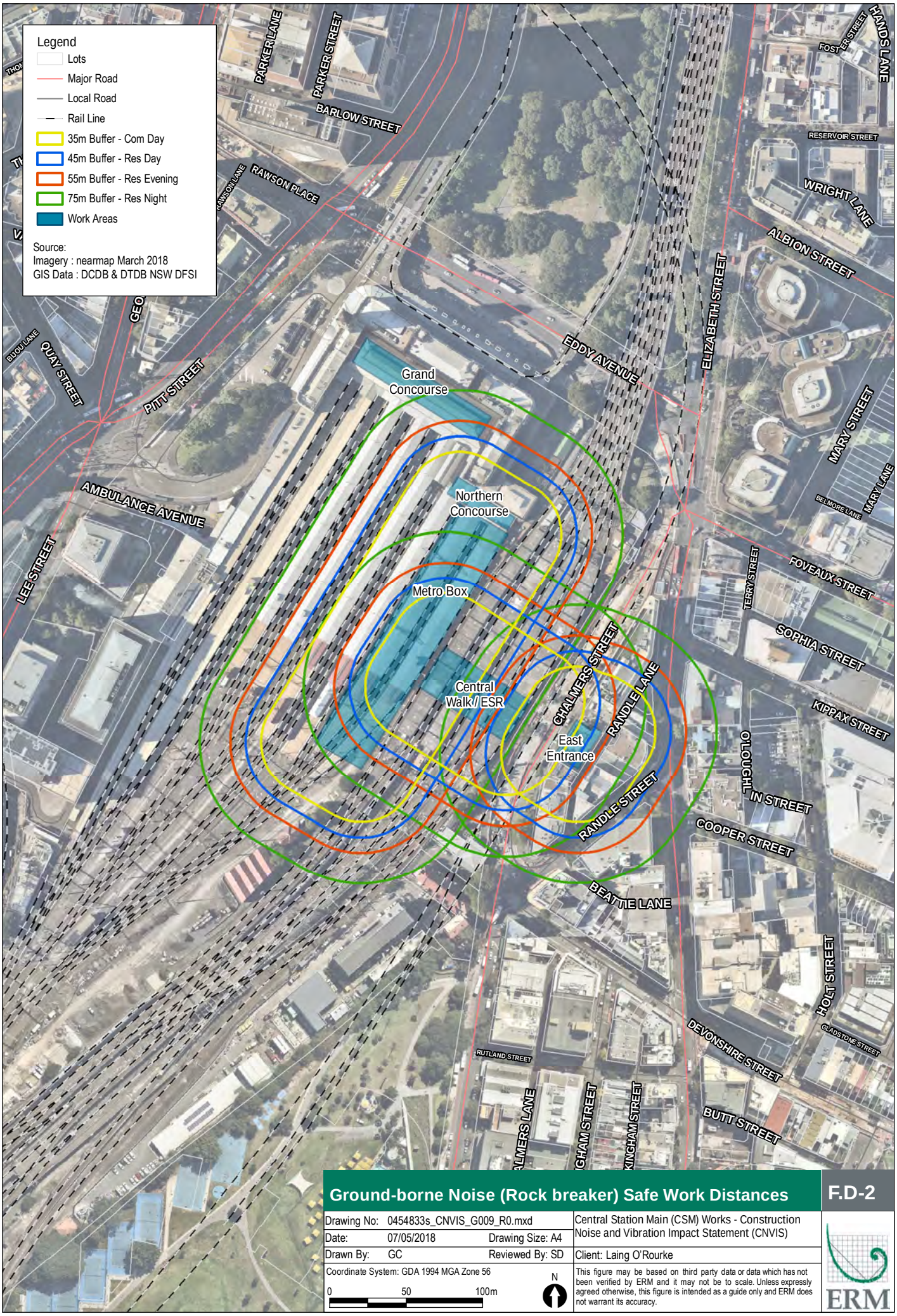
Drawing No:	0454833s_CNVIS_G008_R0.mxd		Central Station Main (CSM) Works - Construction Noise and Vibration Impact Statement (CNVIS)
Date:	07/05/2018	Drawing Size: A4	
Drawn By:	GC	Reviewed By: SD	Client: Laing O'Rourke

Coordinate System: GDA 1994 MGA Zone 56

0 50 100m

N

ERM



Ground-borne Noise (Rock breaker) Safe Work Distances

F.D-2

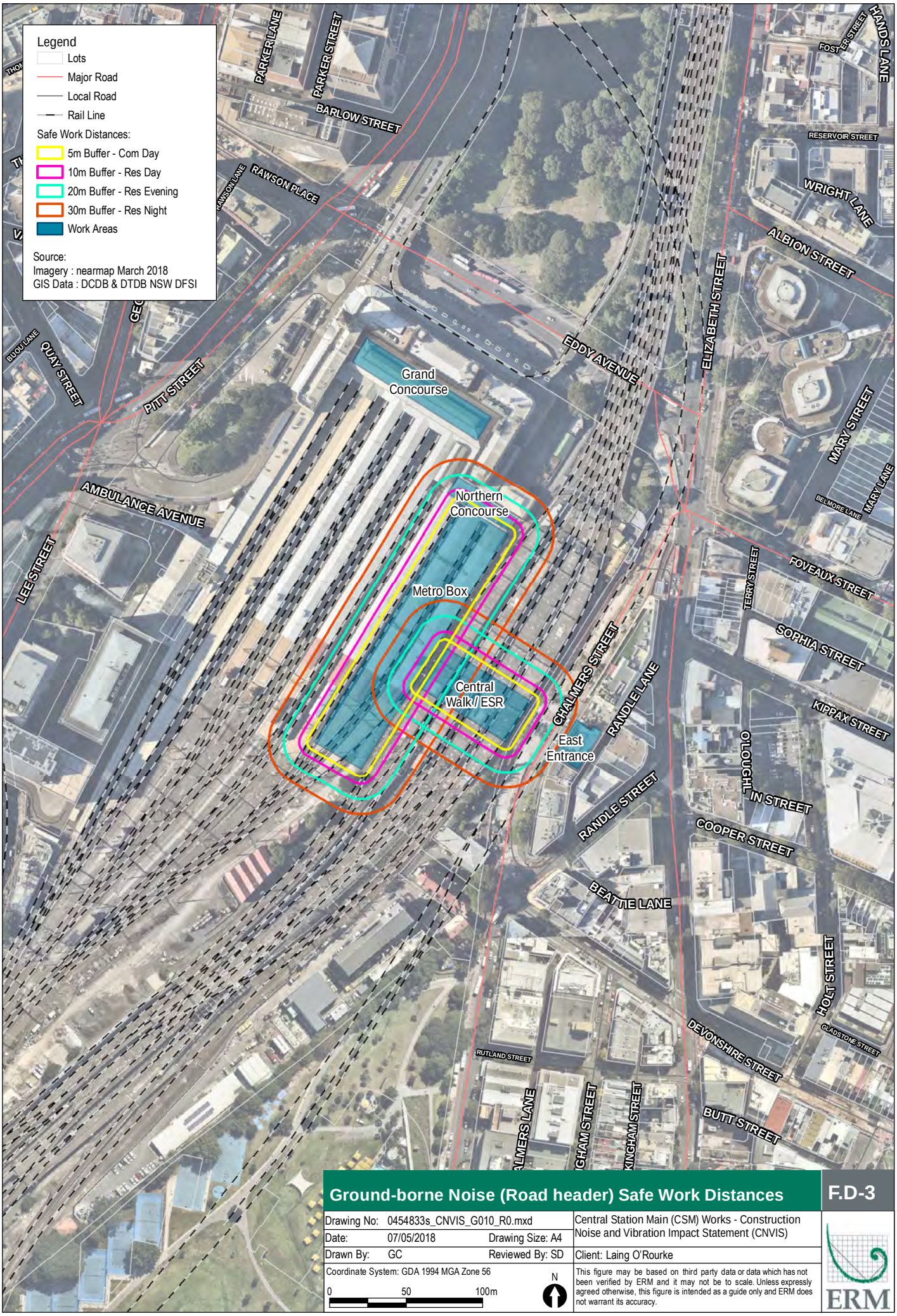
Drawing No:	0454833s_CNVIS_G009_R0.mxd		Central Station Main (CSM) Works - Construction Noise and Vibration Impact Statement (CNVIS)
Date:	07/05/2018	Drawing Size: A4	
Drawn By:	GC	Reviewed By: SD	Client: Laing O'Rourke

Coordinate System: GDA 1994 MGA Zone 56

0 50 100m

N

ERM



Ground-borne Noise (Road header) Safe Work Distances

F.D-3

Drawing No:	0454833s_CNVIS_G010_R0.mxd		Central Station Main (CSM) Works - Construction Noise and Vibration Impact Statement (CNVIS)
Date:	07/05/2018	Drawing Size: A4	
Drawn By:	GC	Reviewed By: SD	Client: Laing O'Rourke

Coordinate System: GDA 1994 MGA Zone 56

0 50 100m

N

ERM

Annex E

Consultation for CoA E33

CNVIS Consultation Tracker - Metro CSM Project

Affected	Address	Stakeholder	Consulted?	Planned consultation	AA/RO triggered under scenario	Note
Priority affected	2 Chalmers Street	Dental Hospital	YES FRI 14/6	Health NSW requested meeting for 14/6		May require negotiated agreement re: vibration for sensitive equipment
Priority affected	8-10 Lee Street	Railway Square YHA	YES FRI 1/6 AM		SCN02 (AA, RO), SCN14, 29, 30, 32 (RO)	SCN02 unlikely to occur at night and trigger AA/RO May require negotiated agreement
Priority affected	30-34 Chalmers Street	Commercial tenants on ground floor	YES THU 7/6 AM			
Priority affected	30-34 Chalmers Street	Residential	YES THU 7/6 PM	Email sent for proeprty owners and tenants.	SCN05, 13, 14, 16A, 16B, 16C, 16D, 18, 20, 22, 29, 30, 32 (RO) SCN17 (AA, RO)	
Priority affected	38 Chalmers Street	Residential	YES THU 7/6 PM	Email sent for proeprty owners and tenants.	SCN05, 13, 14, 16B, 16C, 16D, 17, 18, 20, 22, 29, 30, 32 (RO)	
Priority affected	38 Chalmers Street	City Convenience Store	YES THU 7/6 PM			
Priority affected	52 Regent Street	Residential		NOT ABLE TO CONTACT AS DIRECTED BY METRO.	SCN39 (RO)	Unresolved issues with Metro May require negotiated agreement
Priority affected	54 Regent Street	Residential		NOT ABLE TO CONTACT AS DIRECTED BY METRO.	SCN30, 32, 39 (RO)	Unresolved issues with Metro May require negotiated agreement
Priority affected	14-18 Lee Street	Commercial tenants including TfNSW (Dexus)	YES TUE 12/6 PM			
Priority affected	1-5 Randle Street	Residential	YES TUE 12/6 PM	Email sent for proeprty owners and tenants.		
Priority affected	Other Lee Street	Commercial	YES FRI 1/6 PM			
Priority affected	Central Station tenants		YES TUE 12/6 PM			
Priority affected	2 Lee St	Adina Hotel	YES FRI 1/6 AM			
Priority affected	20 Lee St	NSW Gov departments various	YES FRI 1/6 AM			Consulted and will continue to engage with stakeholder as required.
Priority affected	26 Lee St	Dept of Home Affairs	YES FRI 1/6 AM			Consulted and will continue to engage with stakeholder as required.
Affected	2/812B George St	Christ Church St Laurence Parish Office	YES FRI 15/6 PM			
Affected	260 Elizabeth St	CBRE Centennial Plaza	YES FRI 15/6 PM			
Affected	509 Pitt St	Wake up Sydney	UNDERWAY FRI 15/6 PM	Meeting scheduled with owner on Friday 22 June.		
Affected	280 Elizabeth St	CBRE Centennial Plaza	YES FRI 15/6 PM			

Affected	300 Elizabeth St	CBRE Centennial Plaza	YES FRI 15/6 PM			
Affected	302-306 Elizabeth St	Woolworths				
Affected	302-306 Elizabeth St	Wentworth Institute	YES FRI 15/6 PM			
Affected	20 Lee St	Commercial tenants including govt depts	UNDERWAY INT DISC MON 4/6			
Affected	7 Randle St	Ding Dong Dang				
Affected	11 Randle St	Robert - Hanave Investment	YES FRI 1/6 PM			
Affected	17 Randle Street (46 Chalmers)	DB Property (various commercial)	YES THU 7/6 PM		SCN05, 13, 14, 16B, 16C, 16D, 17, 18, 20, 22, 29, 30, 32 (RO)	CNVIS triggers AMMM based on residential receiver - TBC that this property is commercial only
Affected	28-30 Regent St	28 Hotel	YES FRI 1/6 AM			
Affected	Shop 1 49-53 Regent St	Sunrise	YES FRI 1/6 AM			
Affected	Shop 2 49-53 Regent St	VR Corner	YES FRI 1/6 AM			
Affected	49-53 Regent St	Residential	YES INT DISC MON 4/6 AM EMAIL FOLLOW UP 18/6 PM			
Affected	55 Regent St	Education Centre Australia/Asia Pacific International College	YES FRI 1/6 AM			
Affected	Shop 1 61-65 Regent St	La Café	YES FRI 1/6 AM			
Affected	61-65 Regent St	Residential	YES INT DISC MON 4/6 AM EMAIL FOLLOW UP 18/6 AM			
Affected	1 67-69 Regent	Morrisonlow Consulting	YES FRI 1/6 AM			
Affected	2 67-69 Regent	?				UNOCCUPIED
Affected	3,4,5 67-69 Regent St	WFS Australia	YES FRI 1/6 AM			
Affected	71-75 Regent St	Residential				Strata manager or body corp unknown. Building inaccessible.
Affected	105 Regent St	Residential				
Affected	105 Chalmers St Prince Alfred Park	City Community Tennis	YES MON 4/6 PM			
Affected	242 Cleveland St	St Andrews Greek Orthodox Theological College/Greek Orthodox Australia Arch Diocese/Cathedral of Annunciation	UNDERWAY INT DISC MON 4/6			
Affected	15 Randle St	Mills Gallery	UNOCCUPIED			
Affected	101 Chalmers St	Metallurgical Systems	YES MON 4/6 PM EMAIL 5/6 PM			
Affected	101 Chalmers St	Interface Australia HQ	YES FRI 1/6 PM			
Affected	52 Devonshire St	Madison Hotel				

Affected	86- 88 Chalmers St	Royal Exhibition Hotel				
Recommended additional	2-24 Rawson Pl	Service NSW and various NSW gov	YES FRI 15/6 PM			
Recommended additional	11 Rawson Pl	Sydney Central YHA	YES FRI 15/6 PM			
Recommended additional	34 Regent Street	Residential				
Recommended additional	Corner Regent Street and Wellington Street	Unknown development - obtain contact details for possible future interface				
Recommended additional	87-97 Regent St	Commercial				
Recommended additional	111-113 Meagher St	Café Ideas				
Recommended additional	Commercial/residential on Regent Street between Meagher and Cleveland Streets					
Recommended additional	419 Elizabeth Street	Commercial				
Recommended additional	Commercial/residential properties on Elizabeth Street between Kippax and Cooper Steets					
Recommended additional	66-70 Regent St	Service station				
Recommended additional	15-31 Terry St					
Recommended additional	1-15 Fevaux	Australian Institute of Music	YES MON 4/6 PM			

HBI Healthy Buildings International Pty Ltd
A.C.N. 003 270 693 A.B.N. 39 003 270 693

Suite 2.06, Level 2
29-31 Solent Circuit
Norwest NSW 2153

Tel: 61 (02) 9659 5433
e-mail: hbi@hbi.com.au
Web: www.hbi.com.au

Stuart Hodgson
Director
Program Sustainability Environment & Planning
Sydney Metro
Transport for NSW
PO Box K659
HAYMARKET NSW 1240

19 December 2018

Ref: CSMW CNVIS –V5

Dear Stuart

RE: Endorsement of Sydney Metro City and Southwest – Central Station Main Works -Construction Noise and Vibration Impact Statement

Thank you for providing the following documents for Environmental Representative (ER) review under Condition E33 of the Infrastructure Approval SSI 15_7400:

- Central Station Main Works Construction Noise and Vibration Impact Statement (Revision 5 dated 21 November 2018).
- Acoustic Advisor (AA) Endorsement (of the above document) dated 18 December 2018.

As an approved ER for the Sydney Metro City & Southwest project, I have reviewed the above documents. The review did not comprise a technical review, as the ER has relied upon the AA's review of technical aspects of the document. The CNVIS (Rev 05) has been updated with the revised construction-related traffic numbers.

On the basis of the recent Modification 5 (dated 21 November 2018); the endorsement of the document by the AA; and subject to the conditions outlined in the AA endorsement; the CNVIS is endorsed as required under Condition A24(d) as appropriate for implementation.

Yours sincerely

Annabelle Reyes
Environmental Representative – Sydney Metro – City and South West

ENDORSEMENT

CITY & SOUTHWEST ACOUSTIC ADVISOR

Review of	**Central Station Main works Construction Noise and Vibration Impact Statement (CNVIS)**	**Document reference:**	V.05 dated 21/11/18 Ref 0454833RP01
Prepared by:	Dave Anderson		
Date of issue:	18 December 2018		

As approved Acoustic Advisor for the Sydney Metro City & Southwest project, I have reviewed and provided comment on the Construction Noise and Vibration Impact Statement (CNVIS) for the Central Station Main Works, as required under A27 (d) of the project approval conditions.

The CNVIS covers excavation and construction activities at Central Station, including demolition of the Bounce Hotel near the east entrance, piling and excavation works using a road-header and rock breakers.

I previously endorsed revision 0.4 of this CNVIS. Revision 0.5 has been updated with revised construction-related traffic numbers. Revision 0.5 retains the commitment to further refine noise and vibration predictions and impacts, and available mitigation measures including consultation regarding timing of works, for the following sensitive receivers:

- The Dental Hospital, which may have vibration-sensitive equipment as well as noise sensitive activity affected by works near the eastern entry site;
- Receivers on Regent Street near the Sydney Yard Access Bridge, which will be used to carry spoil from excavation activities at the station.

The CSM CNVMP commits to close consultation and coordination of works with Sydney Trains, including staff, tenants and customers, as well as vibration-sensitive structures such as heritage items and operational rail infrastructure.

I endorse revision 5 of the impact statement in relation to the works documented at the Central Station Main Work sites.

Dave Anderson, City & Southwest Acoustic Advisor