

20220030.15/1510A/R4/AW

17/09/2024

Mirvac Retail Sub SPV Pty Limited
Level 28
200 George Street
SYDNEY NSW 2000

Attn: Anne Ng

Harbourside - SSD 49295711 / MOD2 - Acoustic Assessment**1 INTRODUCTION**

This acoustic report has been prepared by Acoustic Logic on behalf of Mirvac Retail Sub SPV Pty Ltd (Mircvac) and is submitted in support of a Section 4.55(1A) Modification Application submitted to the Department of Planning, Housing and Infrastructure (DPHI), to modify development consent SSD 49295711 relating to the detailed design, construction, and operation of the new Harbourside mixed-use podium and tower building.

The proposed Modification Application (SSD 49295711 MOD 2) relates to the following:

- Expansion of permissible uses on level 1 to include commercial / event & function spaces;
- Amendments to the design of the ground floor residential and southern commercial lobbies;
- Amendments to level 4 office layout;
- Amendments to level 5 internal pool, external amenities and communal open space;
- Amendments to the general layout of levels 6 – 8;
- Amendments to levels 46 – 49 penthouse and rooftop plant;
- Various amendments to building services, plant, podium rooftop and facades following further design development and coordination; and
- Inclusion of design changes to the Bunn Street through-site link as required by the consent.

For a detailed description of the proposed modifications, please refer to the Modification Report prepared by Ethos Urban.

SYDNEY
9 Sarah St
MASCOT NSW 2020
(02) 8339 8000ABN 98 145 324 714
www.acousticlogic.com.au

The information in this document is the property of Acoustic Logic Pty Ltd 98 145 324 714 and shall be returned on demand. It is issued on the condition that, except with our written permission, it must not be reproduced, copied or communicated to any other party nor be used for any purpose other than that stated in particular enquiry, order or contract with which it is issued.

2 SUMMARISED PROJECT NOISE EMISSION OBJECTIVES

Noise emission objectives relative to the project site are outlined within the SSDA 2 Acoustic Assessment previously and approved in support of SSD-49295711 (Ref: 20220030.1/3110A/R3/LA). Noise emission objectives relative to the operation of the L1 floorplate as event space have been summarised within the tables below.

Table 2-1 – Harbourside Residential Tower Entertainment Precinct Internal Noise Objectives

Receiver	Time Period	Internal Noise Objectives dB(A) $L_{eq}(15min)$	
		Bedrooms	Living Rooms
Harbourside Residential Tower	Day and Evening (7am-10pm)	38	43
	Late Evening (10pm-12am)	35	40
	Overnight (12am-7am)	25	

Table 2-2 – L&GNSW Noise Emission Objectives (Operational Noise) – dB(A) $L_{10}(15min)$

Receiver	Time	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
R8 (High Level)	Day (7am-6pm)	69	67	73	64	61	59	53	44	36	64
	Evening (6pm-10pm)	69	67	73	64	61	59	53	44	36	64
	Night (10pm-12am)	61	60	66	57	54	52	46	37	29	57
	Overnight (12am-7am)	Patron activity noise to be inaudible after midnight.									
R12	Day (7am-6pm)	71	70	76	67	64	62	56	47	39	67
	Evening (6pm-10pm)	71	70	76	67	64	62	56	47	39	67
	Night (10pm-12am)	67	65	71	62	59	57	51	42	34	62
	Overnight (12am-7am)	Patron activity noise to be inaudible after midnight.									

3 NOISE IMPACTS ASSOCIATED WITH MOD-2 ALTERATIONS AND ADDITIONS

The majority of changes proposed as part of MOD 2 relate to internal layout modifications, and do not impact noise or vibration impacts either to or from the development.

Incorporation of permissible uses for an event and conference centre (in addition to the previously allowable commercial space) have the potential to generate noise from the development. In particular, patron noise and amplified music may be generated by the use of this space, and so consideration should be given to noise emissions – both to external residents close to the site, as well as future residents within the tower above.

As part of the development application for SSD 49295711 an acoustic report was prepared and submitted. This report developed and specified acoustic criteria for noise impacts to all surrounding residential receivers, which can be summarised as:

- For residents external to the development, implementation of standard NSW Liquor & Gaming noise conditions, which require an assessment of noise compared to the background level in octave bands. Post-midnight, inaudibility is required within habitable spaces of residences.
- For residents within the Harbourside development, an alternative internal noise criteria, developed in line with similar entertainment precincts both within Sydney and globally, has been adopted.

Permissible event and conference uses are proposed across the level 1 floorplate. Whilst façades will be operable at certain locations, the primary use will be internal. This arrangement provides the opportunity to allow for windows to be open during less noise sensitive periods (e.g. day and evening), and closed to provide sound insulation during quieter periods such as night time. We also note that the proposed operable façade zone faces Darling Harbour, away from nearby residents, which allows for the natural screening of noise afforded by the building form.

Retail uses on the ground floor contain external dining areas (typically areas with the highest potential for noise generation), and have been shown to be capable of compliance with the most stringent noise emission criteria for the development up to midnight.

To investigate the potential noise impacts associated with the proposed change of use of the Level 01 area to allow for event and conferencing uses, predicted environmental noise modelling has been conducted in conjunction with the modelling of the Ground floor retail tenancies. The results of this environmental noise modelling have been presented within the following sections.

3.1 SOUNDPLAN ENVIRONMENTAL NOISE MODELLING

Use of the Level 1 floorplate for the purposes of event and conferencing have been modelled cumulatively with the use of the Ground Floor and L2 outdoor dining areas in order to assess the predicted noise impacts of this operation on surrounding noise sensitive receivers.

3.1.1 Modelling Information and Assumptions

The following information and assumptions have been used within the modelling of the L1 event space, in conjunction with use of the outdoor patron areas:

- L1 Event/Conference Use:
 - The accessible GFA servicing the event and conferencing use within the L1 floorplate has been assessed at 11,600m² shared across the floorplate cumulatively.
 - The maximum capacity for the event and conferencing uses across the L1 floorplate is proposed to be 3000 patrons and 280 staff, and these patrons and staff have been assumed to be equally distributed across the floorplate.
 - An internally average spatial L_{eq} of 95dB(A) from amplified music has been modelled for internal spaces across the L1 floorplate, in order to simulate the impacts of live amplified music within the event areas.
 - It is assumed that the operable western façade of the L1 floorplate is closed during the nighttime period (Between 10pm and 7am). The operable façade has been assumed to be entirely open at all other times.
 - An external outdoor area has been modelled to the eastern boundary of the northern most segment to simulate external uses within this area.
 - It is assumed that 1 in every 2 people are talking at a given time.
 - A sound power level per patron of 77dB(A) with 1 in 2 talking within a licenced environment at any one time.
 - Noise levels for people talking have been modelled at a height of 1.5m AFL.
- Use of retail areas within the Waterfront Promenade and Waterfront Garden– Note, the modelling provided is consistent with the modelled scenario presented within the SSDA Acoustic Assessment for Stage 2 Approval (Ref: 20220030.1/3110A/R3/LA):
 - A sound power level per patron of 77dB(A) with 1 in 2 talking within a licenced environment at any one time.
 - Noise from breakout from internal areas has been assessed assuming all glazing area to be open (sliding doors) and has been modelled with a conservative capacity of 1 person per m².
 - Noise emissions from outdoor spaces has been modelled to a distance 5m from the façade and has been modelled with a conservative capacity of 1 person per m².
 - Noise levels for people talking have been modelled at a height of 1.5m AFL.
 - Licensed area within the Waterfront Garden has been modelled to a total of 16 people within the licensed area, as nominated within the Landscape plans.
 - As locations of individual food and beverage tenancies are yet to be determined, noise has been modelled from all tenancies adjoining to the boardwalk. Noise emissions associated with food and beverage/entertainment patrons has been provided in principle, and the proposed numbers are not reflective of the final or proposed patron volumes, noting that operation is yet to be proposed. Individual tenancies will be subject to the requirements of their own approval and associated environmental noise impact assessment.

3.1.2 Modelled Scenario Discussion

There are various assumptions which are inherently incorporated into the modelled scenario which do not fully capture the impacts of the locality on the environmental noise generation of the site on surrounding noise receivers. Some of these assumptions include:

- Foliage surrounding the project site generally has not been accounted for exclusive of the variation in ground absorption for these areas. Due to the noise absorptive properties of plants and greenery, it is likely that planting areas will provide some increased attenuation of the noise generated across the site to surrounding receivers, especially to lower levels of 50 Murray Street, which is surrounded by dense foliage.
- Due to limitations with the SoundPlan Noise Modelling software, the impacts of the Pyrmont Bridge are unable to be appropriately accounted for within the model and therefore this has been excluded from the model. In reality, the Pyrmont Bridge will provide some line-of-sight screening from the retail and L1 event areas to some of the residential receiver locations to the west of the site.
- An internally spatially average L_{eq} of 95dB(A) has been modelled across the L1 floorplate in its entirety to simulate the impacts of the noise generation associated with Live music with an open façade. This is an absolute worst case potential impact from this usage, noting that it is extremely unlikely that, were all of L1 were to operate concurrently in an event operation mode, that Live music would be concurrently played at this level across the floorplate, and that the eastern façade would be fully open across the floorplate.
- Further, openings in the façade have been modelled as full height, however it is likely that obstructions (balustrades, columns etc.) will break up line of sight to the internal spaces within the L1 floorplate, and hence the noise impact will be reduced.

Based on the above, it is likely that the predicted noise levels presented within this assessment present a highly conservative assessment of the noise impacts of the use, and hence it is expected that the impacts of this use will be lower than that presented in practice.

3.2 SOUNDPLAN MODELLING

Noise levels have been predicted at the receiver locations using SoundPLAN™ 8.0 modelling software implementing the ISO 9613-2:1996 "Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation" noise propagation standard.

Noise enhancing meteorological effects have been adopted as recommended by the NPfI, noting that the ISO 9613 modelling approach assumes that all receivers are 'downwind' (i.e., that noise enhancing wind conditions are in effect at all times).

Ground absorption was conservatively calculated with a ground factor of 0 for all areas except for localised lawns and greenery with a ground factor of 0.6 as recommended in *Engineering Noise Control* (Bies & Hanson).

In line with Factsheet C of the NPfI, penalties for annoying noise characteristics should be applied at the receiver, where applicable. Based on the predicted noise levels, no penalty should be applied (either for tonality, intermittency, or otherwise).

The following figures present the results of the SoundPLAN Noise modelling, and results are summarised in Table 12.

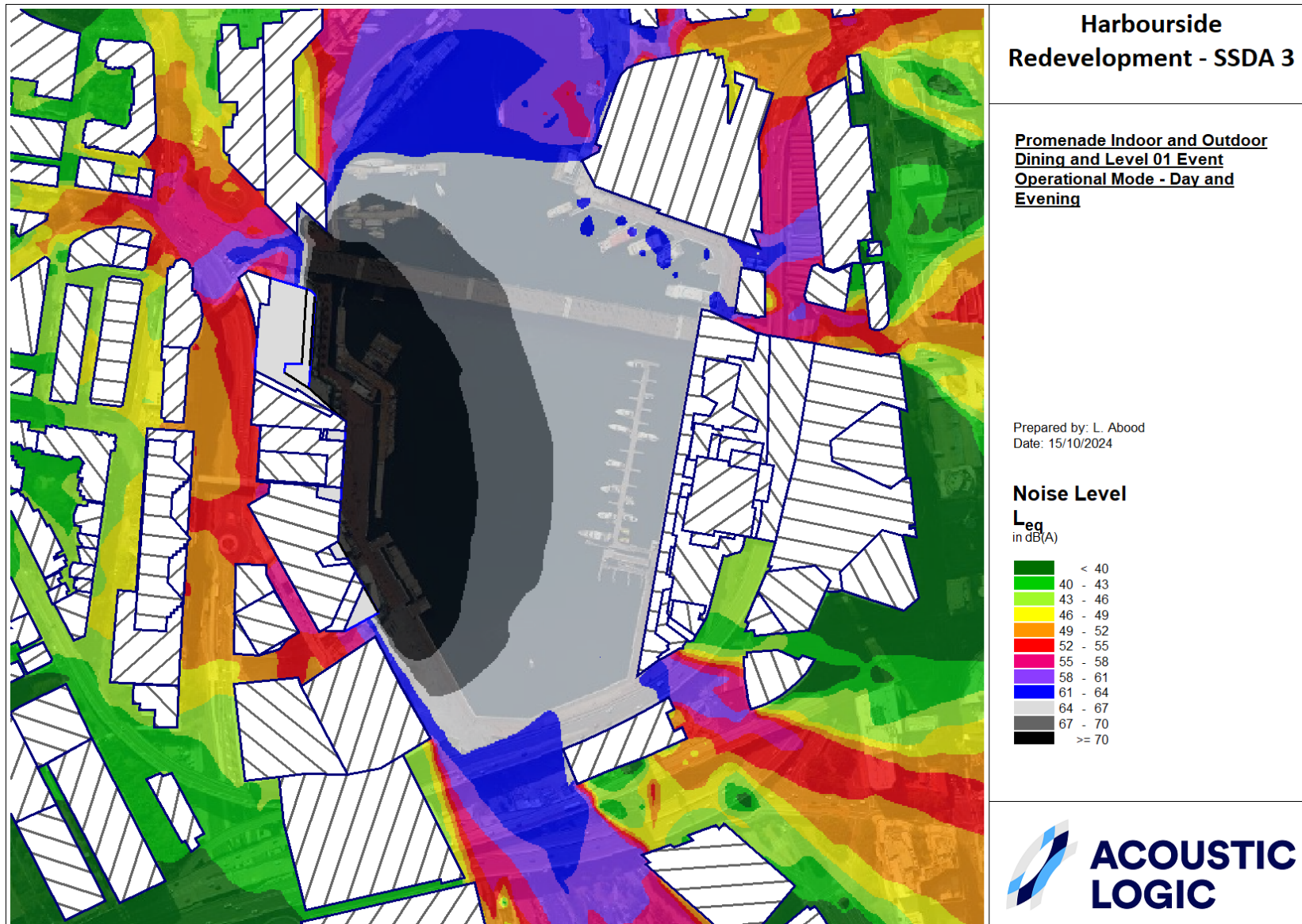


Figure 1: Promenade Indoor and Outdoor Dining and L1 Event Use – Day and Evening

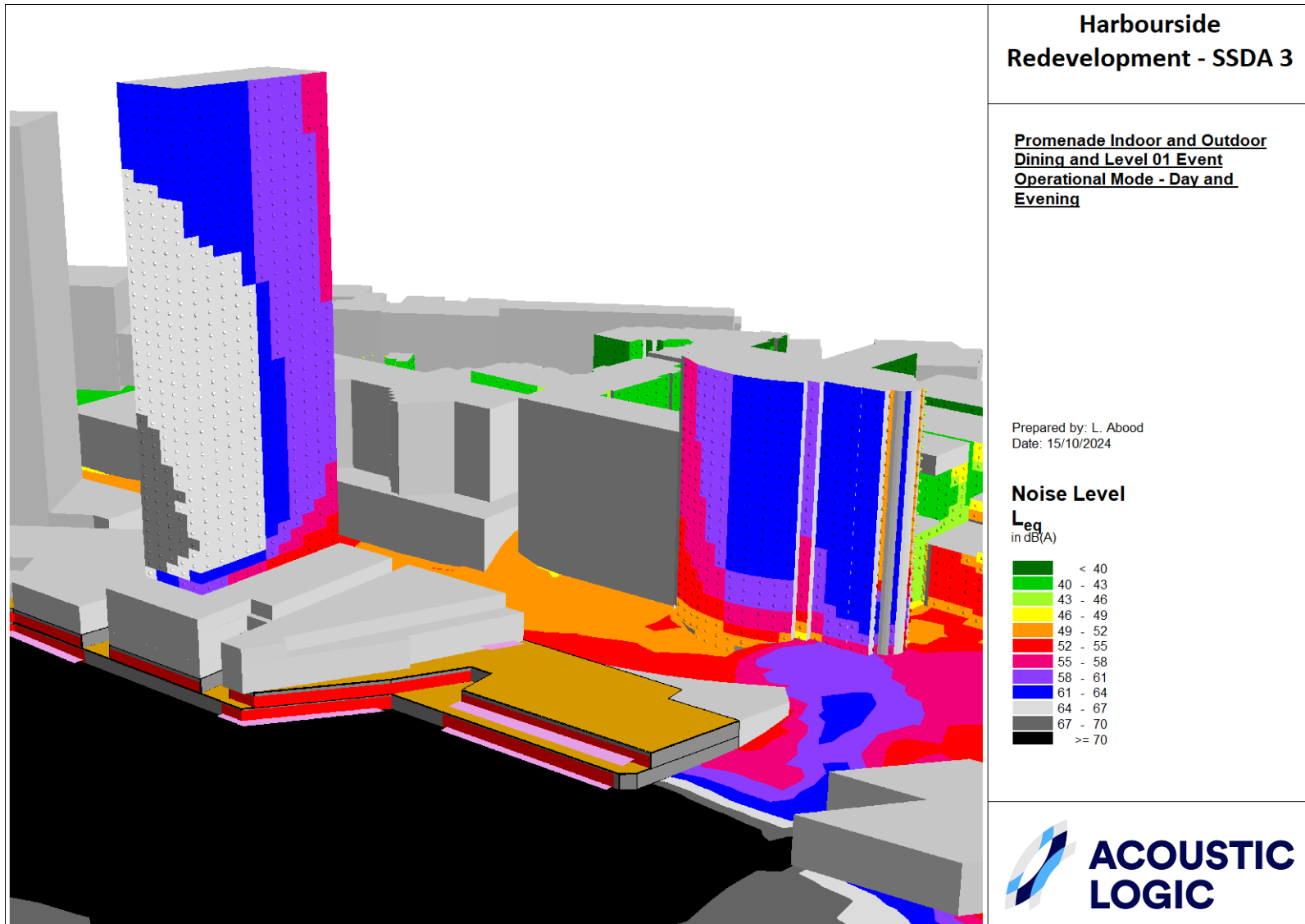


Figure 2: Promenade Indoor and Outdoor Dining and L1 Event Use – Day and Evening – Tower and R8

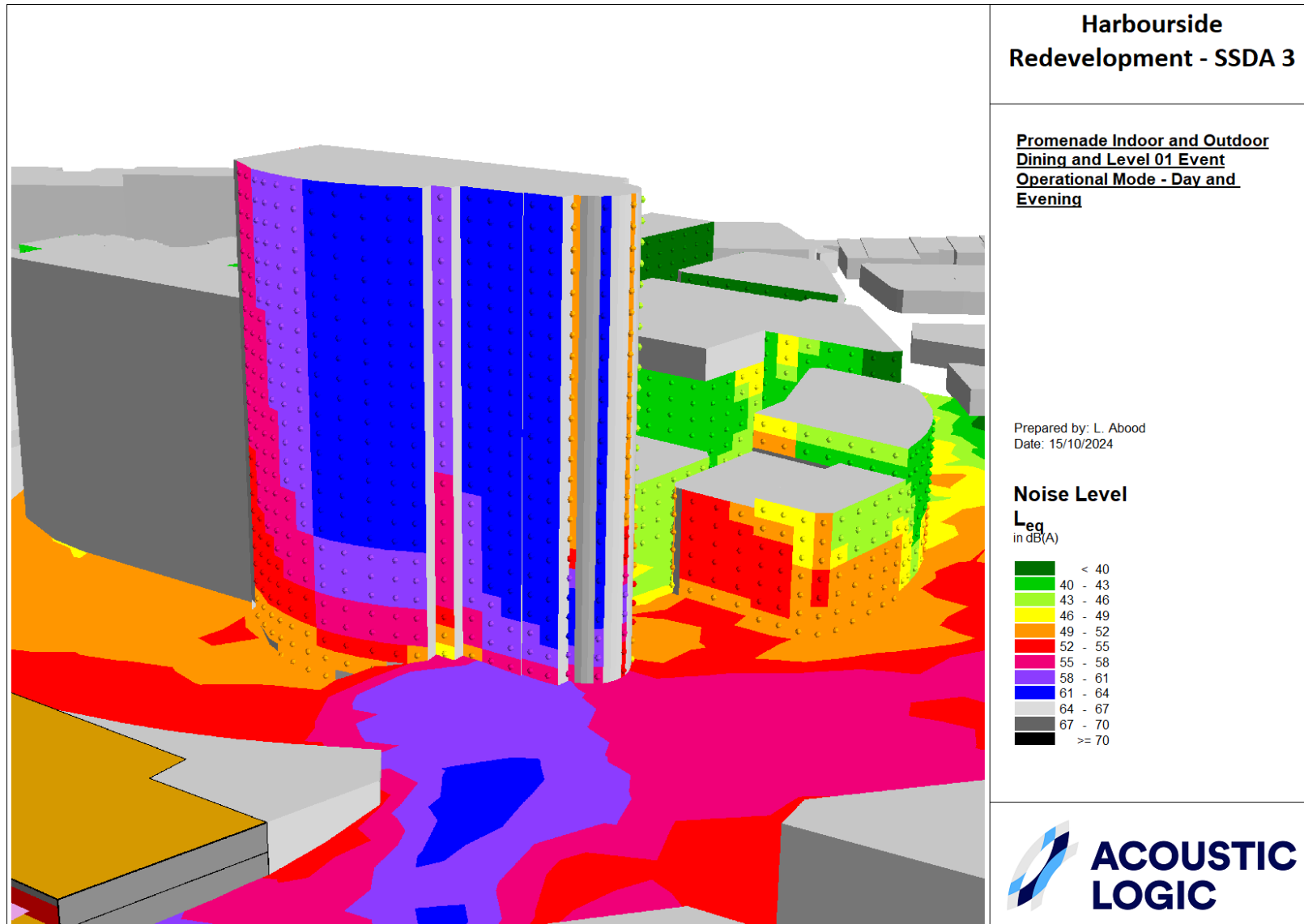


Figure 3: Promenade Indoor and Outdoor Dining and L1 Event Use – Day and Evening – R8 and R12

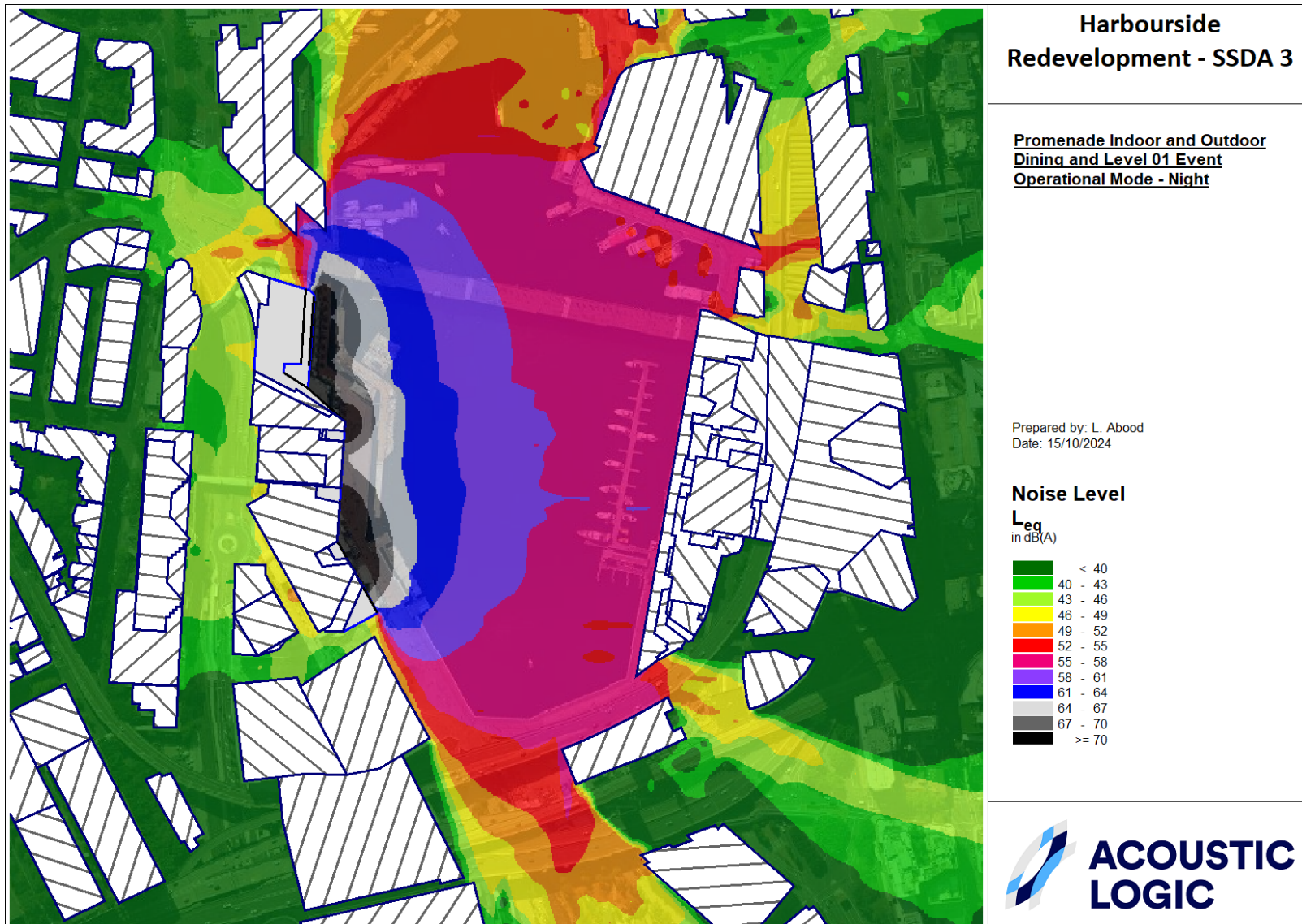


Figure 4: Promenade Indoor and Outdoor Dining and L1 Event Use – Night

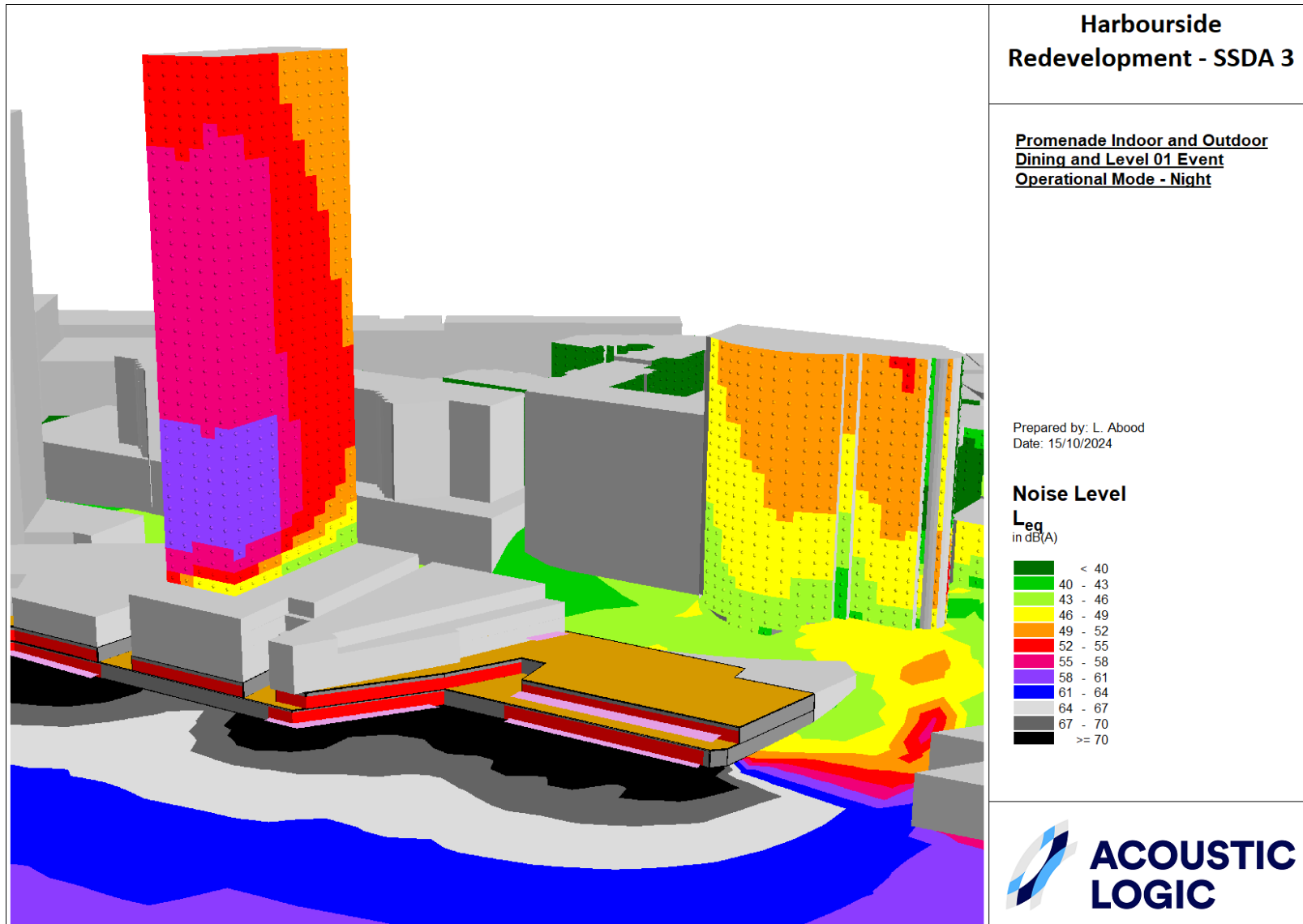


Figure 5: Promenade Indoor and Outdoor Dining and L1 Event Use – Night – Tower and R8

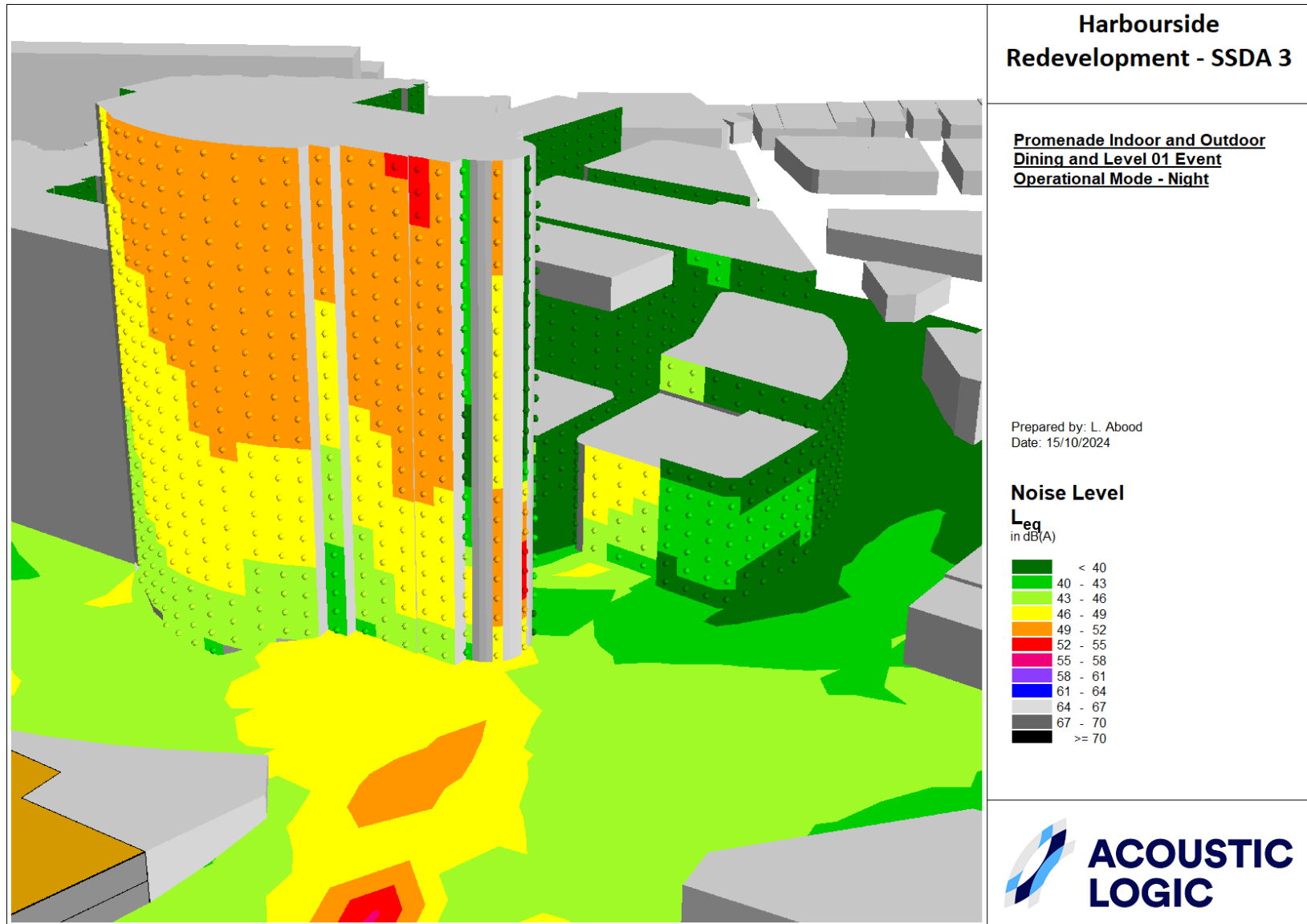


Figure 6: Promenade Indoor and Outdoor Dining and L1 Event Use – Night – R8 and R12

Table 3-1 – Predicted External Noise Levels – dB(A) L_{10(15min)}

Receiver	Noise Level dB(A) L ₁₀	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
R8	Predicted Noise Level - Day and Evening	66	67	70	63	58	59	52	40	32	63
	Day / Evening Criteria	69	67	73	64	61	59	53	44	36	64
	Predicted Noise Level - Night	55	56	59	52	47	48	41	29	21	52
	Night Criteria (10pm-12am)	61	60	66	57	54	52	46	37	29	57
R12	Predicted Noise Level - Day and Evening	59	58	61	54	49	50	43	31	23	54
	Day / Evening Criteria	71	70	76	67	64	62	56	47	39	67
	Predicted Noise Level - Night	50	51	54	47	42	43	36	<30	<20	47
	Night Criteria (10pm-12am)	67	65	71	62	59	57	51	42	34	62

3.3 RESULTS DISCUSSION

With respect to the above, we note the following:

- An absolute worst-case usage of the Level 1 floorplate has been modelled, noting that the modelled scenario assumes that live music is being played across the entirety of the floorplate, and that the entire eastern façade is open.
- This absolute worst-case usage has been shown to comply with relevant NSWL&G standard noise conditions at the nearest noise sensitive receivers during daytime and evening periods (Between 7am and 10pm).
- Between 10pm and 12am, it is required that the eastern façade be closed exclusive of patron ingress and egress, in order to achieve relevant acoustic requirements at surrounding receivers.
- Note that this does not restrict the ability of the L1 floorplate to utilise outdoor spaces during this period, only that music is to be limited to background noise levels within these outdoor areas, as opposed to having live music (Maximum spatially averaged dB(A)_{Leq} ≤ 70).
- Assessment of the noise impacts of the L1 floorplate during operation after midnight is not currently proposed, noting that significant contribution of the noise levels generated across the development during the nighttime operational model are attributed to the ground floor retail tenancies outdoor dining

areas, and that the intended operation of these ground floor spaces is yet to be confirmed and are subject to separate approval.

- In any case, it is expected that operation of the L1 floorplate for the purposes of event and conferencing uses is expected to comply after midnight, provided the operable façade is closed.

Whilst unlikely, if event usage of the L1 floorplate were proposed to be of a higher intensity than envisaged as part of this assessment, various management controls could be employed to further reduce the impacts of this noise generation on surrounding noise sensitive receivers. These include:

- Assessment of patron numbers.
- Consideration of operational hours.
- Specification of amplified noise levels.
- Management controls, such as closure of external windows/doors at certain times of the day, or during specific scenarios.

4 CONCLUSION

This report presents a discussion of the noise impacts associated with the proposed MOD-2 scope of work within the Harbourside Redevelopment.

Please contact us should you have any further queries.

Yours faithfully,



Acoustic Logic Pty Ltd
Alex Washer