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19-29 THE CORSO, MANLY - ALTERATIONS AND ADDITIONS

Acoustic Assessment for DA

6 April 2022

Iris Capital

TM424-01D02 Acoustic Report for DA Apartments (r3)

35 1982-2017 ACOUSTIC ENGINEERING EXCELLENCE

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1 Introduction

Renzo Tonin & Associates were engaged to conduct an environmental noise assessment of alterations and additions to 19-29 The Corso, Manly.

The development involves alterations and additional to the existing building on site to create new ground floor retail and office spaces and reconfiguration of the upper three levels to create 12 apartments. A detailed description is provided in section 2.

Key issues addressed in this report are as follows:

- Traffic noise associated with Darley Rd (and to a lesser extent Market Place) intruding into the development
- Noise from the existing Ivanhoe Hotel – predominantly patron and music noise from the beer garden. Both existing Hotel noise (predominantly beer garden noise) and noise associated with future refurbishment works on the ground floor (gaming room and sports bar) will be discussed.
- Noise from entertainment precinct noise / passing pedestrians, particularly on weekends

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

This report is prepared based on drawings by Durbach Block Jaggers dated 1/4/2022.

2 Site and Surrounds

The subject site is located at 19-29 The Corso, Manly.

The proposed development is for alterations and additions to part of the existing buildings on the site, to allow for the adaptive reuse and the stratum and strata subdivision of the land, known as 19-29 The Corso, Manly. This will include new retail spaces at the ground floor of 19-21 The Corso, as well as ancillary office space and building services. At the three upper building levels of 19-23 The Corso, these will be reconfigured to accommodate twelve apartments, being eight, two-bedroom apartments and four, one-bedroom apartments. Each apartment will be provided with a new balcony or wintergarden to provide outdoor living space, which is not currently availed to the residential component of the building.

Works to the remainder of the site are currently subject to a separate modification application to facilitate enhancements to the existing Ivanhoe Hotel. These works relate to the relocation of the ground floor gaming room and sports bar. Noise associated with the operation of the gaming room and sports bar is addressed in the acoustic report prepare as part of that development application (Renzo Tonin report dated 14.2.2022 *19-29 The Corso, Manly, Ivanhoe Hotel – Acoustic Assessment of Alterations and Additions*, rev 1).

The application also seeks to create three separate stratums, which will principally include The Ivanhoe Hotel, the retail tenancies and the residential component of the building. The residential apartments will be subject to further strata subdivision.

The site is surrounded by Manly Library and Whistler Street carpark to the North, retail/commercial buildings on the west, the Ivanhoe Hotel to the Northeast and a mixture of retail/commercial, residential and St Matthew's Church opposite on Darley Road / The Corso.

The primary noise sources impacting the site are:

- Beer Garden/Night Club noise form the Ivanhoe Hotel.
- Pedestrian noise from the Corso.

Late night weekend noise from the Ivanhoe Hotel and The Corso are of particular concern.

Figure 1 below shows site surrounds and location of long-term noise monitoring locations.

Figure 1 - Aerial view of subject site, including monitoring locations and nearest receivers

Nearest residential noise receivers are as follows:

- Receiver 1 (R1) – Apartments at 2 Darley Street.
- Receiver 2 (R2) -Apartments at 5 and 7 Whistler Street.
- Receiver 3 (R3) – Apartments at 63 The Corso.

3 Measured Noise Levels

The noise environment at the site was determined by a combination of long term noise logging and attended noise measurements.

3.1 Long-term Noise Survey

Long term unattended noise monitoring was undertaken on the roof of 25 The Corso and out a window of 19-23 The Corso, Manly from 27/10/2021 to 03/11/2021.

The noise loggers recorded noise levels on a continuous basis and stored data every fifteen minutes. The noise loggers were calibrated before and after measurements and no significant deviation in calibration was noted. The noise monitoring equipment used here complies with Australian Standard 1259.2-1990 "Acoustics - Sound Level Meters" and is designated as Type 1 instruments suitable for field use.

The results of the background and ambient noise monitoring conducted on site are presented in the tables below.

3.2 Existing Noise Environment

The results of the long-term noise monitoring have been summarised in accordance with Noise Policy for Industry requirements published by the NSW Environment Protection Authority's Noise Policy for Industry and are presented in the tables below.

Table 1: Measured Site Background Noise Levels

Noise Monitoring		Representative L_{A90} Background Noise Levels in dB(A)		
Location	**Duration**	**Day[1]**	**Evening[2]**	**Night[3]**
L1: 25 The Corso (facing Market Place)	27/10/2021 to 03/11/2021	53	58[4]	47
L2: 19-21 The Corso (facing The Corso)	27/10/2021 to 03/11/2021	55	55	45

Notes:

Day, Evening & Night assessment periods are defined in accordance NSW EPA's Noise Policy for Industry as follows.

1. Day is defined as 7:00am to 6:00pm, Monday to Saturday; 8:00am to 6:00pm Sundays & Public Holidays.
2. Evening is defined as 6:00pm to 10:00pm, Monday to Sunday & Public Holidays
3. Night is defined as 10:00pm to 7:00am, Monday to Saturday; 10:00pm to 8:00am Sundays & Public Holidays
4. Majority of evening time periods were impacted by noise from the Ivanhoe Hotel

Table 2: Measured Site Ambient Noise Level

Noise Monitoring		Representative L_{Aeq} Ambient Noise Levels in dB(A)		
Location	**Duration**	**Day[1]**	**Evening[2]**	**Night[3]**
L1: 25 The Corso (facing Market Place)	27/10/2021 to 03/11/2021	65	69	71
L2: 19-21 The Corso (facing The Corso)	27/10/2021 to 03/11/2021	60	59	57

Notes:

Day, Evening & Night assessment periods are defined in accordance NSW EPA's Noise Policy for Industry as follows.

1. Day is defined as 7:00am to 6:00pm, Monday to Saturday; 8:00am to 6:00pm Sundays & Public Holidays.
2. Evening is defined as 6:00pm to 10:00pm, Monday to Sunday & Public Holidays
3. Night is defined as 10:00pm to 7:00am, Monday to Saturday; 10:00pm to 8:00am Sundays & Public Holidays

The measured background (L_{A90}) noise levels are representative of surrounding residential neighbours and are used in setting operational noise emission goals from the development such as mechanical ventilation and air-conditioning systems in accordance to EPA Noise Policy for Industry (NPfI).

3.3 Measured Corso/Ivanhoe Hotel Activity Noise Levels

The long term unattended noise monitors were located so as to determine impacts on the site from traffic and activity noise, in particular weekend night time noise from The Corso and the Ivanhoe Hotel beer garden. These measurements were undertaken from the 27th of October 2021 to the 3rd of November 2021. The measured Hotel activity noise levels are presented Table 3 below. The were no Covid trading restrictions on the Ivanhoe Hotel during the measurement period to our knowledge.

The long term unattended noise monitors were located so as to determine impacts on the site from The Corso pedestrian/entertainment precinct noise as well as activity noise from the Ivanhoe Hotel Beer Garden. The monitoring locations will be representative of the noise levels impacting the site from the Ivanhoe Hotel (for the eastern façade) and The Corso pedestrian noise (southern façade).

Table 3: Representative Day and Night Traffic/Activity Noise Levels

Monitoring Location	Survey Period	Measured/Predicted Traffic Noise Level $L_{Aeq,\ T}$ [1,2,3] Worst Affected Residential Façade	
		Day time (7am to 10pm)	Night-time (10pm to 7am)
L1: 25 The Corso (facing Market Place)	27/10/2021 to 03/11/2021	67 $L_{Aeq\ (15hour)}$ 78[3] $L_{Aeq\ (worst\ 1hour,\ Saturday)}$	61 $L_{Aeq\ (9hour)}$ 78[3] $L_{Aeq\ (worst\ 1hour,\ Saturday)}$
L2: 19-21 The Corso (facing The Corso)	27/10/2021 to 03/11/2021	62 $L_{Aeq\ (15hour)}$ 68 $L_{Aeq\ (worst\ 1hour,\ Saturday)}$	58 $L_{Aeq\ (9hour)}$ 68 $L_{Aeq\ (worst\ 1hour,\ Saturday)}$

Notes:

1. Noise levels presented are facade values.
2. Representative road traffic noise level in measured L_{Aeq} over 15 hour and 9 hour day and night period respectively.
3. Measured level dominated by noise from beer garden, and measurement location is representative of façade of 23 The Corso.

4 External Noise Intrusion Assessment

This section presents the assessment of noise intrusion from road traffic noise, rooftop mechanical plant and patron and music noise.

4.1 Noise Intrusion Criteria

The Standards and Council Development Control Plans (DCP) relevant to this development are as follows:

- Manly Development Control Plan 2013 (Amendment 11)
- Australian Standard AS/NZS 2107:2016 "Acoustics – Recommended design sound pressure levels and reverberation times for building interior"

Section 3.4 of the Manly Development Control Plan identifies the importance of design taking into account licenced premises. The DCP does not, however, set any numerical noise goals that need to be addressed for development in entertainment areas/areas near existing licenced premises.

In the absence of numerical noise criteria, guidance is sought from Australian Standard AS/NZS 2107. Internal noise goals recommended for this development are outlined in the table below.

Table 4: Recommended Maximum Internal Noise Levels

Type of Occupancy / Activity	Windows & Doors Condition	Maximum Internal Noise Level	
		Day, L_{Aeq} (15hour)	Night, L_{Aeq} (9hour)
Sleeping areas	Closed	-	35dB(A)
All other habitable rooms	Closed	40dB(A)	40dB(A)
Retail	Closed	50dB(A)[1]	-

Notes:

1. Based on Australia Standard AS2107 "Acoustics – Recommended design sound pressure levels and reverberation times for building interior"

Results of the background and ambient noise monitoring conducted on site are presented in Appendix A.

4.2 Recommendations

Refer to section 6 for recommendations to address external noise impacts on the site.

5 Noise Emission Assessment

This section presents the project criteria in respect of external noise emissions from the proposed development.

5.1 Noise Emission Criteria

5.1.1 External Noise Emission from Building Services

The NSW Environment Protection Authority (EPA) sets out noise criteria in its Noise Policy for Industry (NPfI) to control the noise emission from industrial sources.

The NPfI sets project noise trigger level to protect noise amenity for residential receivers. The project noise trigger level is set as the lower value of the following two assessment components:

- Controlling intrusive noise impacts in the short term for residences; and
- Maintaining noise level amenity for particular land uses for residences and other land uses.

Noise intrusiveness ensures that industrial noise does not exceed the background noise level by an excessive margin, preventing significant changes in the noise characteristic pertinent to the development site and surrounds. This is commonly referred to as the 'background plus 5' criterion. That is, the noise level from new industrial development, assessed in periods of 15 minutes, should not exceed the existing background noise level (measured in the absence of that development) by more than 5dB(A).

Noise amenity ensures that industrial noise levels do not increase without limit, for if a number of industrial noise sources are permitted to increase the background noise level by 5dB(A), in turn there would be a point where the ultimate noise level is unacceptable. A limit on the ultimate acceptable noise level is therefore included in the NPfI as a way of ensuring that cumulative noise impact from industrial growth is curtailed. This limit is referred to as the project amenity noise level. The appropriate limit in any circumstance relates to the land use category, for example, there are different limits for rural, suburban and urban areas.

The table below presents the recommended amenity noise level relevant to the receivers surrounding the proposed development site. The project amenity noise level is defined as the recommended amenity noise level minus 5dB(A).

Table 5: NPfI Amenity Noise Levels - Recommended L_{Aeq} Amenity Noise Levels from Industrial Noise Sources [EPA NPfI Table 2.1]

Receiver	Noise amenity area	Time of day	L_{Aeq}, dB(A)
			Recommended amenity noise level
Residential	Urban	Day	60
		Evening	50
		Night	45
Hotels, motels, caretakers' quarters, holiday accommodation, permanent resident caravan parks	See column 4	See Column 4	5dB(A) above the recommended amenity noise level for a residence for the relevant noise amenity area and time of day
Commercial premises	All	When in use	65
Place of Public Worship (internal)	All	When in use	40 (internal)
Library (classed as commercial)	All	When in use	65

Notes:

- Daytime 7.00 am to 6.00 pm; Evening 6.00 pm to 10.00 pm; Night-time 10.00 pm to 7.00 am
- On Sundays and Public Holidays, Daytime 8.00 am - 6.00 pm; Evening 6.00 pm - 10.00 pm; Night-time 10.00 pm - 8.00 am.
- The LAeq index corresponds to the level of noise equivalent to the energy average of noise levels occurring over a measurement period.

In accordance with Section 2.4 of the NPfI, the following **exceptions** to the above method to derive the project amenity noise level apply:

1. In areas with high traffic noise levels (see Section 2.4.1 of the NPfI).
2. In proposed developments in major industrial clusters (see Section 2.4.2 of the NPfI).
3. Where the resultant project amenity noise level is 10dB, or more, lower than the existing industrial noise level. In this case the project amenity noise levels can be set at 10dB below existing industrial noise levels if it can be demonstrated that existing industrial noise levels are unlikely to reduce over time.
4. Where cumulative industrial noise is not a necessary consideration because no other industries are present in the area, or likely to be introduced into the area in the future. In such cases the relevant amenity noise level is assigned as the project amenity noise level for the development.

The following tables presents the site-specific noise production criteria for plant noise from site. Table 6 presents noise emission goals to residential property R1 (2 Darley Street). Table 7 presents noise emission goals to residential properties R2 and R3 (5 and 7 Whistler Street).

Table 6: Project noise trigger level for noise emission from mechanical plant to residential neighbours R1 (EPA NPfI)

Time of Day	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9
	Rating Background Level (RBL) LA90	Intrusive-ness Trigger Level, (RBL+5) $L_{Aeq,\ 15minute}$	Recommended Amenity Noise Level (RANL), $L_{Aeq,\ period}$	Project Amenity Noise Level (PANL), $L_{Aeq,\ period}$	Measured $L_{Aeq,\ period}$ existing noise levels	Traffic noise exceed the RANL by more than 10dB?	Existing noise level likely to decrease in future?	Exceptions to PANL $L_{Aeq,\ period}$?	Project Noise Trigger Level, $L_{Aeq,\ 15minute}$
Day (7am to 6pm)	55	60	60	55	60	No	No	None	58
Evening (6pm to 10pm)	55	60	50	45	59	No	No	None	48
Night (10pm to 7am)	45	50	45	40	57	No	No	None	43

Explanatory notes:

Column 1 – RBL measured in accordance with the NPfI and outlined in the results of the long-term noise monitoring has been summarised in accordance with NPfI requirements and are presented in Table 1 above. Where the evening time criterion is greater than the daytime criterion, the evening time goal is amended to be the same as the daytime criteria.

Column 4 – Project Amenity Noise Level determined based on 'Residential - Suburban' area in Table 2.2 (Amenity noise levels) of the EPA's NPfI minus 5dB

Column 5 – Measured in accordance with the NPfI

Column 6 – The existing environmental noise level does exceed the RANL by more than 10dB at night but it is not all traffic noise. As such, no correction is applicable. In respect of the North Steyne façade of 43-45 North Steyne, it would be considered traffic noise affected but it is not the worst affected location by sources applicable to the NPfI.

Column 8 - Determined in accordance with Section 2.4 of the NPfI.

Column 9 – Project Noise Trigger Level is the lower value of project intrusiveness noise level and project amenity noise level. In accordance with Section 2.2 of the NPfI, $L_{Aeq,\ 15minute}$ is calculated as $L_{Aeq,\ period}$ + 3dB(A)

Notes: Intrusiveness noise level for Evening must be set at no greater than the intrusiveness level for daytime in accordance with NPfI Section 2.3.

Table 7: Project noise trigger level for noise emission from mechanical plant to residential neighbours R2 and R3 (EPA NPfI)

Time of Day	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9
	Rating Background Level (RBL) LA90	Intrusive-ness Trigger Level, (RBL+5) $L_{Aeq,\ 15minute}$	Recommended Amenity Noise Level (RANL), $L_{Aeq,\ period}$	Project Amenity Noise Level (PANL), $L_{Aeq,\ period}$	Measured $L_{Aeq,\ period}$ existing noise levels	Traffic noise exceed the RANL by more than 10dB?	Existing noise level likely to decrease in future?	Exceptions to PANL $L_{Aeq,\ period}$?	Project Noise Trigger Level, $L_{Aeq,\ 15minute}$
Day (7am to 6pm)	53	58	60	55	65	No	No	None	58
Evening (6pm to 10pm)	58	58	50	45	69	No	No	None	48
Night (10pm to 7am)	47	52	45	40	71	No	No	None	43

Explanatory notes:

Column 1 – RBL measured in accordance with the NPfI and outlined in the results of the long-term noise monitoring has been summarised in accordance with NPfI requirements and are presented in Table 1 above.

Column 2 - Where the evening time criterion is greater than the daytime criterion, the evening time goal is amended to be the same as the daytime criteria.

Column 4 – Project Amenity Noise Level determined based on 'Residential - Suburban' area in Table 2.2 (Amenity noise levels) of the EPA's NPfI minus 5dB

Column 5 – Measured in accordance with the NPfI

Column 6 – The existing environmental noise level does exceed the RANL by more than 10dB at night but it is not all traffic noise. As such, no correction is applicable. In respect of the North Steyne façade of 43-45 North Steyne, it would be considered traffic noise affected but it is not the worst affected location by sources applicable to the NPfI.

Column 8 - Determined in accordance with Section 2.4 of the NPfI.

Column 9 – Project Noise Trigger Level is the lower value of project intrusiveness noise level and project amenity noise level. In accordance with Section 2.2 of the NPfI, $L_{Aeq,\ 15minute}$ is calculated as $L_{Aeq,\ period}$ + 3dB(A)

Notes: Intrusiveness noise level for Evening must be set at no greater than the intrusiveness level for daytime in accordance with NPfI Section 2.3.

The following table below presents the site-specific noise production criteria from industrial noise sources, namely mechanical plant to neighbouring commercial properties.

Table 8: Project noise trigger level for noise emission from mechanical plant to commercial and POPW neighbours (EPA NPfI)

Assessment / Receiver location	Amenity[4] criteria, $L_{Aeq, period}$ dB(A)		
	Day	Evening	Night
Commercial buildings to the north, south and south west of the development	63 (when in use)		
St Matthew's Church	40, internal, (when in use) 50 externally at façade (assuming naturally ventilated)		

Where necessary, noise mitigation treatments to mechanical plant such as carpark exhaust fans and air conditioning systems will be incorporated in the design to ensure that noise levels comply with the recommended NPfI noise emission criteria noted above.

5.2 Analysis and Recommendations

See section 6.

6 Recommendations

The acoustic treatments set out in this section are provided with a view to ensuring that:

- External noise at the site is attenuated to the target internal noise levels as detailed in section 4.1.
- Noise emitted from the site is compliant with the noise goals set out in section 5.

6.1 Glazing Design Requirements

The primary noise impact on the site is from the operation of the Ivanhoe Beer Garden. To a lesser degree, the site is also impacted by noise from the (proposed redeveloped ground floor of the Hotel (relocated beer garden and sports bar) and from pedestrian noise from The Corso. All of these noise sources have been considered when determining appropriate façade acoustic treatments to the new apartments.

The table below presents recommended glazing treatment for the building facades to achieve compliance with the maximum noise levels nominated in Table 4 above taking into account all noise sources outlined above. Note these are indicative only and treatments are to be reviewed/confirmed during detailed design stage.

Refer also to Appendix B for Mark up of glazing treatments.

Table 9: Recommended Glazing Treatment

Level	Occupancy Type	Facade	Location / Room Type	Typical Compliance Glazing Thickness, Type and Configuration	Laboratory Test Reference
Ground	Commercial/Retail	Market Place	All	10mm (R_w33)	ESTIMATE
		Corso	All	10mm (R_w33)	ESTIMATE
Resi-dential	All	All	All	Refer to Appendix B	

By way of explanation, the Sound Insulation Rating Rw is a measure of the noise reduction property of the partition, a higher rating implying a higher sound reduction performance.

Note that the Rw rating of systems measured as built on site (R'w Field Test) may be up to 5 points lower than the laboratory result.

LEGEND where no appropriate test certificate exists:

1. ESTIMATE: The client is advised not to commence detailing or otherwise commit to partition construction systems which have not been tested in an approved laboratory or for which an opinion only is available. Testing of partition construction systems is a component of the quality control of the design process and should be viewed as a priority because there is no guarantee the forecast results will be achieved thereby necessitating the use of an alternative which may affect the cost and timing of the project. No responsibility is taken for use of or reliance upon untested partition construction systems, estimates or opinions. The advice provided here is in respect of acoustics only.
2. ESTIMATE – APPROVED FOR CONSTRUCTION: Use of the form of construction is approved prior to laboratory certification. To complete the quality control of the design process and confirm the acoustical performance of the construction, we recommend testing in a laboratory to confirm the Rw rating as soon as practicable. In the case of impact rating for floor systems, no particular impact rating is guaranteed to comply with either the Building Code of Australia or Strata Scheme Management Act and hence carpet runners may still be required.
3. ESTIMATE – TEST NOT REQUIRED: Use of the form of construction is approved without laboratory certification. The STC/Rw of the form of construction exceeds the project requirements.

The advice provided here is in respect of acoustics only. Supplementary professional advice may need to be sought in respect of fire ratings, structural design, buildability, fitness for purpose and the like.

NOTES FOR GLAZING CONSTRUCTIONS:

4. The information in this table is provided for the purpose of Council approvals process and cost planning and shall not be used for construction unless otherwise approved in writing by the acoustic consultant.
5. The design in this table is preliminary and a comprehensive assessment shall be conducted prior to Construction Certification.
6. Before committing to any form of construction or committing to any builder, advice should be sought from an acoustic consultant to ensure that adequate provisions are made for any variations which may occur as a result of changes to the form of construction where only an "estimate" is available for the sound insulation properties of recommended materials.
7. The glazing supplier shall ensure that installation techniques will not diminish the Rw performance of the glazing when installed on site.
8. All openable glass windows and doors shall incorporate full perimeter acoustic seals equivalent to Q-Lon, which enable the Rw rating performance of the glazing to not be reduced.
9. The above glazing thicknesses should be considered the minimum thicknesses to achieve acoustical ratings. Greater glazing thicknesses may be required for structural loading, wind loading etc.

GENERAL

10. The sealing of all gaps in partitions is critical in a sound rated construction. Use only sealer approved by the acoustic consultant.
11. Check design of all junction details with acoustic consultant prior to construction.
12. Check the necessity for HOLD POINTS with the acoustic consultant to ensure that all building details have been correctly interpreted and constructed.
13. The information provided in this table is subject to modification and review without notice.
14. The advice provided here is in respect of acoustics only. Supplementary professional advice may need to be sought in respect of fire ratings, structural design, buildability, fitness for purpose and the like.

6.2 Building Ventilation

It is recommended that the bedrooms and living areas be provided with alternative ventilation/air-conditioning such that they can keep the windows closed if they so choose. Any outside air opening for a ventilation system is to be designed such that the acoustic performance of the building shell is not impacted.

6.3 External Walls and Roof

External walls to consist of masonry. Bedrooms on the eastern façade on Level 2 and 3 are to have 2x13mm plasterboard lining to studwork installed on the eastern wall.

The proposed concrete roof is acoustically acceptable.

6.4 Glazing Assembly Requirements

The following acoustic measures should also be incorporated into the building design:

- All operable glass windows and doors shall incorporate full perimeter acoustic seals equivalent to Q-Lon, which enable the R_w rating performance of the glazing to not be reduced.
- The glazing thicknesses outlined in should be considered the minimum thicknesses to achieve acoustical ratings. Greater glazing thicknesses may be required for structural loading, wind loading etc.
- The glazing supplier shall ensure that installation techniques will not diminish the R_w performance of the glazing when installed on site. Sliding door meeting stiles should form an airtight seal when closed and locked.
- The perimeter of all window and door frames are to be sealed airtight in the external facade using the following methods:

6.5 Winter Garden and Balustrade to Level 3 Balconies

Winter gardens are to be capable of being enclosed (glass louvres or equal, minimum R_w of 26).

Eastern edge of the balconies on Level 3 to be minimum 2m high, with no gaps. Glass elements to be minimum 6mm thick.

6.6 Noise Control Measures for Mechanical Plant

As details of other mechanical plant and equipment are not available at this stage of the development the following in principle noise control advice is provided.

- Acoustic assessment of mechanical services equipment will be required to be undertaken during the detailed design phase of the development to ensure that they shall not emit noise levels which exceed the noise limits established in Tables 6, 7 and 8.
- Mechanical plant noise emission can be controllable by appropriate mechanical system design and implementation of common engineering methods that may include any of the following;
    - procurement of 'quiet' plant

- strategic positioning of plant equipment away from sensitive neighbouring premises, maximising the intervening shielding between the plant and sensitive neighbouring premises
- installation of commercially available silencers or acoustic attenuators for air discharge and air intakes of plant
- acoustically lined and lagged ductwork
- provide acoustic screens and/or acoustic louvres between plant and sensitive neighbouring premises
- provide partially enclosed or fully enclosed acoustic enclosure over plant
- Mechanical plant shall have their noise specifications and proposed locations checked prior to installation

7 Conclusion

Renzo Tonin & Associates have completed an acoustic assessment of environmental noise impacts onto 19-21 and 23 The Corso, Manly.

The study of external noise intrusion (from Ivanhoe Hotel operations and The Corso noise primarily) into the subject development has found that appropriate noise control measures can be incorporated in order to ensure a reasonable level of acoustic amenity for future residences. Both existing Hotel noise, and future operational noise in the event that the ground level refurbishment of the Hotel is undertaken have been taken into account when designing acoustic treatments to the proposed new apartments.

In addition, noise emission goals for mechanical plant at the site have been nominated.

Recommendations with respect to the above are detailed in section 6. Provided that these recommendations are adopted:

- Future occupants can be adequately protected from Ivanhoe Hotel operational noise (existing and future).

- Noise from plant and equipment from the proposed development itself will be controlled so as to avoid an excessive noise impact on nearby development.

APPENDIX A Results of unattended noise monitoring

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Rear Boundary Facing Market Place

Background & Ambient Noise Monitoring Results - NSW 'Noise Policy for Industry', 2017

Periods with insufficient results excluded	L_{A90} Background Noise Levels[4]			L_{Aeq} Ambient Noise Levels		
Date	**Day[1]**	**Evening[2]**	**Night[3]**	**Day[1]**	**Evening[2]**	**Night[3]**
Wednesday-27-October-2021	-	54	47	-	56	58
Thursday-28-October-2021	53	56	45	57	59	58
Friday-29-October-2021	54	59	47	59	71	75
Saturday-30-October-2021	52	68	49	61	75	78
Sunday-31-October-2021	55	56	44	60	58	58
Monday-01-November-2021	52	58	45	71	63	55
Tuesday-02-November-2021	53	60	50	62	63	62
Wednesday-03-November-2021	-	-	-	-	-	-
Representative Weekday[5]	**53**	**58**	**47**	**66**	**66**	**69**
Representative Weekend[5]	**54**	**62**	**47**	**61**	**72**	**75**
Representative Week[5]	**53**	**58**	**47**	**65**	**69**	**71**

Notes:

1. Day is 7:00am to 6:00pm on all days except Sundays and Public Holidays when it is 8:00am to 6:00pm 2. Evening is 6:00pm to 10:00pm

3. Night is the remaining periods 4. Assessment Background Level (ABL) for individual days 5. Rating Background Level (RBL) for L_{A90} and logarithmic average for L_{Aeq} 6. Leq is calculated in the free field. 2.5dB is subtracted from results if logger is placed at façade 7. Number in brackets represents the measured (actual) RBL value, which is below the minimum policy value of 30 dB(A) during the evening or night period or 35 dB(A) during the day period.

Rear Boundary Facing Market Place

Road / Rail Noise Monitoring Results (at one metre from façade)

Periods with insufficient results excluded	L_{Aeq} Noise Levels		$L_{Aeq\ 1hr}$ Noise Levels			
Date	**Day[1]**	**Night[2]**	**Day - Up[4]**	**Day - Low[5]**	**Night - Up[4]**	**Night - Low[5]**
Wednesday-27-October-2021	-	61	-	-	63	52
Thursday-28-October-2021	60	60	62	58	63	51
Friday-29-October-2021	69	78	70	60	82	53
Saturday-30-October-2021	72	81	74	58	84	60
Sunday-31-October-2021	62	60	64	59	64	46
Monday-01-November-2021	72	57	73	60	60	52
Tuesday-02-November-2021	65	65	67	59	67	58
Wednesday-03-November-2021	-	-	-	-	-	-
Representative Weekday[3]	**67**	**61**	**68**	**59**	**63**	**52**
Representative Weekend[3]	**67**	**70**	**69**	**59**	**74**	**53**
Representative Week[3]	**67**	**61**	**68**	**59**	**64**	**52**

Notes:

1. Day is 7:00am to 10:00pm 2. Night is 10:00pm to 7:00am 3. Median of daily L_{Aeq}

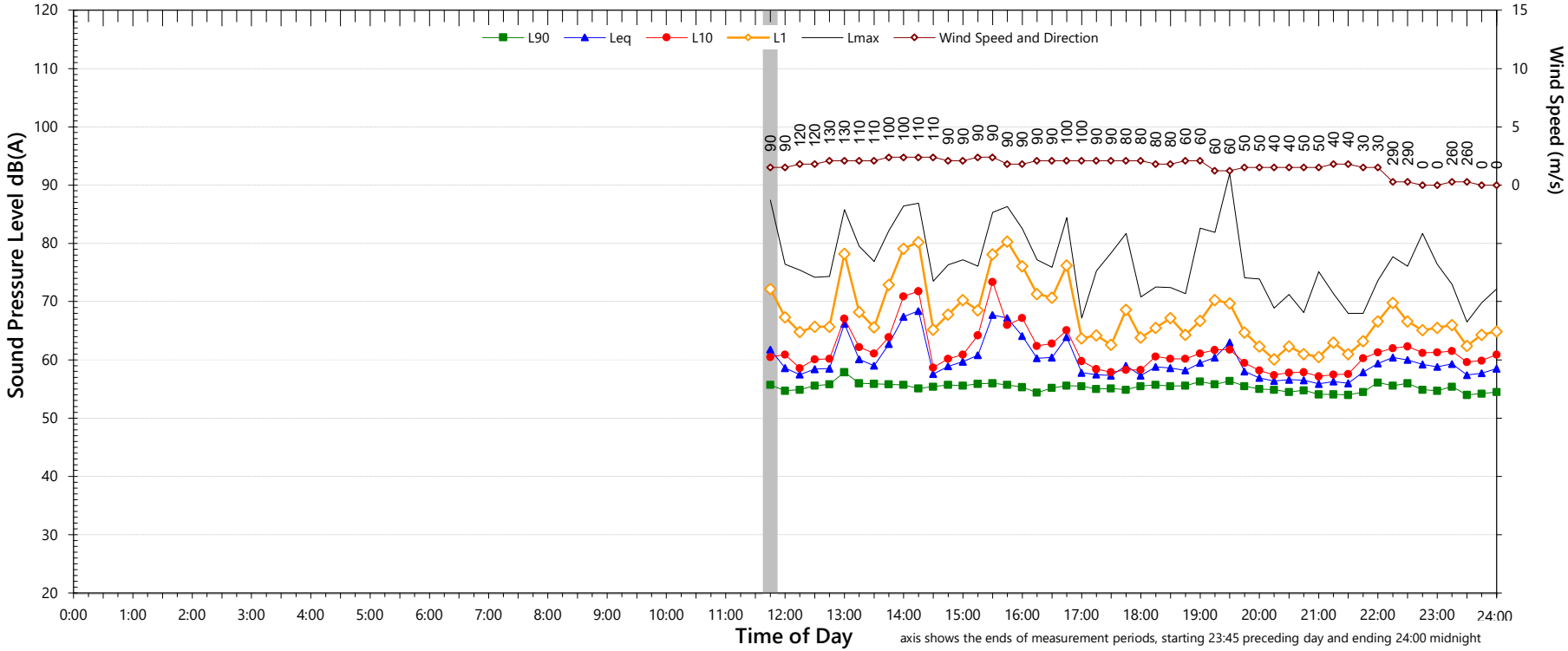
4. Upper 10th percentile $L_{Aeq\ 1hr}$ 5. Lower 10th percentile $L_{Aeq\ 1hr}$

6. Values are calculated at the facade. 2.5dB is added to results if logger is placed in the free field

Unattended Noise Monitoring Results

Rear Boundary Facing Market Place

Wednesday, 27 October 2021



NSW Noise Policy for Industry (Free Field)				
Descriptor		**Day**[2]	**Evening**[3]	**Night**[4 5]
L_{A90} ABL		-	54	47
L_{Aeq}	(see note 6)	-	56	58

Night Time Maximum Noise Levels			(see note 7)
L_{AFMax} (Range)	72	to	90
L_{AFMax} - L_{Aeq} (Range)	17	to	29

NSW Road Noise Policy (1m from facade)		
Descriptor	**Day**	**Night**[5]
	7am-10pm	**10pm-7am**
$L_{Aeq\ 15\ hr}$ and $L_{Aeq\ 9\ hr}$	-	61
$L_{Aeq\ 1hr}$ upper 10 percentile	-	63
$L_{Aeq\ 1hr}$ lower 10 percentile	-	52

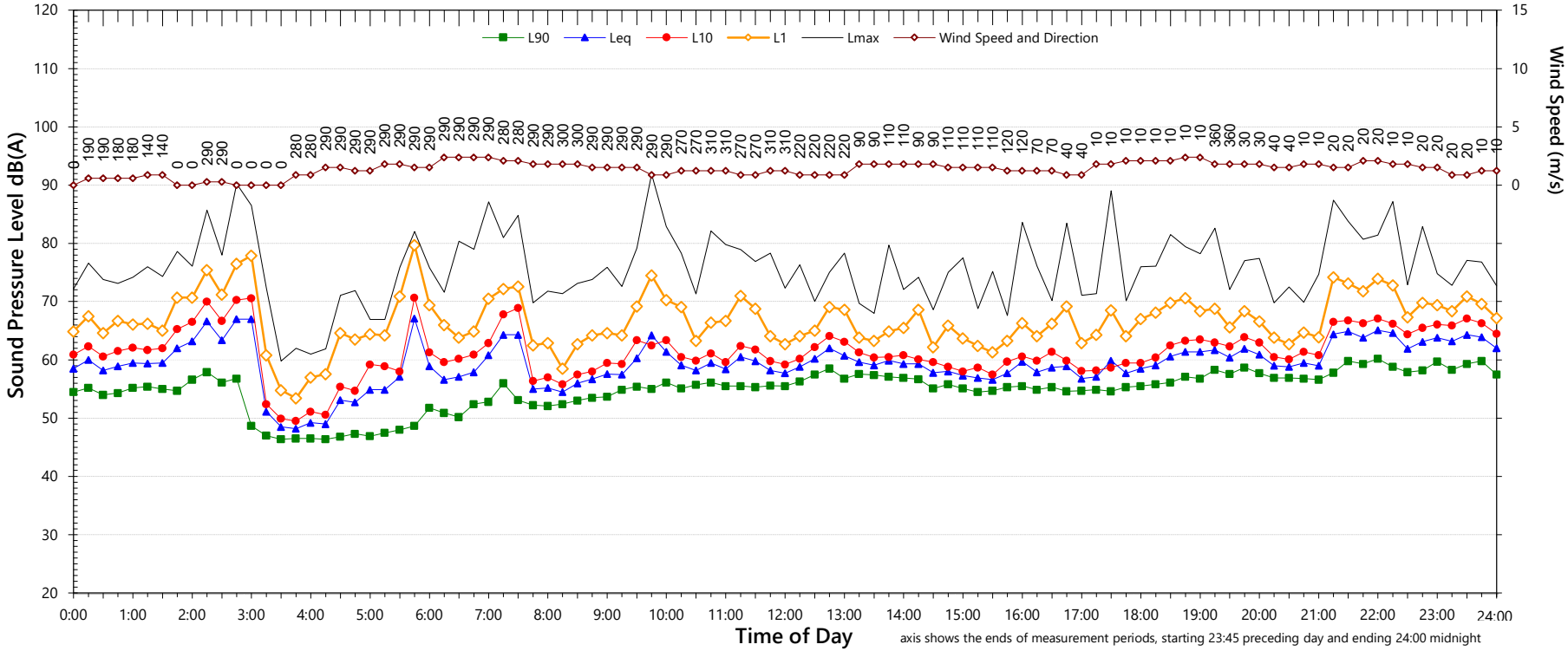
Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Day" is the period from 8am till 6pm on Sundays and 7am till 6pm on other days
3. "Evening" is the period from 6pm till 10pm
4. "Night" relates to the remaining periods
5. "Night" relates to period from 10pm on this graph to morning on the following graph.
6. Graphed data measured 1m from facade; tabulated results free-field corrected
7. 1-hour values for L_{AFMax} are shown only where L_{AFMax} >65dB(A) and where L_{AFMax}- L_{Aeq} ≥15dB(A)

Unattended Noise Monitoring Results

Rear Boundary Facing Market Place

Thursday, 28 October 2021



NSW Noise Policy for Industry (Free Field)				
Descriptor		**Day**[2]	**Evening**[3]	**Night**[4 5]
L_{A90} ABL		53	56	45
L_{Aeq}	(see note 6)	57	59	58

Night Time Maximum Noise Levels			(see note 7)
L_{AFMax} (Range)	68	to	87
L_{AFMax} - L_{Aeq} (Range)	16	to	24

NSW Road Noise Policy (1m from facade)		
Descriptor	**Day**	**Night**[5]
	7am-10pm	**10pm-7am**
$L_{Aeq\ 15\ hr}$ and $L_{Aeq\ 9\ hr}$	60	60
$L_{Aeq\ 1hr}$ upper 10 percentile	62	63
$L_{Aeq\ 1hr}$ lower 10 percentile	58	51

Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Day" is the period from 8am till 6pm on Sundays and 7am till 6pm on other days
3. "Evening" is the period from 6pm till 10pm
4. "Night" relates to the remaining periods
5. "Night" relates to period from 10pm on this graph to morning on the following graph.
6. Graphed data measured 1m from facade; tabulated results free-field corrected
7. 1-hour values for L_{AFMax} are shown only where L_{AFMax} >65dB(A) and where L_{AFMax}- L_{Aeq} ≥15dB(A)

Data File: 2021-10-27_SLM_000_123_Rpt_Report.txt

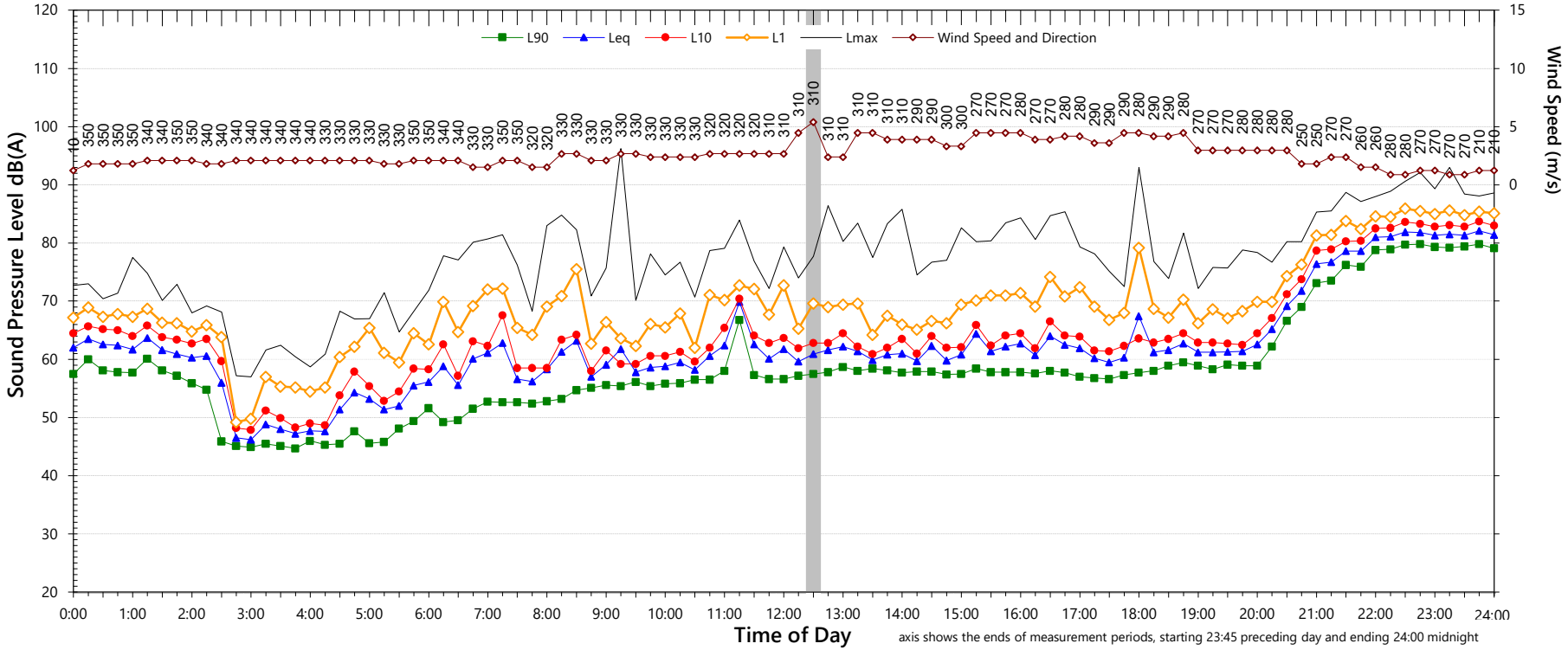
TM424-01L01 rear boundary facing market place (r0)

QTE-26 Logger Graphs Program (r38)

Unattended Noise Monitoring Results

Rear Boundary Facing Market Place

Friday, 29 October 2021



NSW Noise Policy for Industry (Free Field)				
Descriptor		**Day**[2]	**Evening**[3]	**Night**[4 5]
L_{A90} ABL		54	59	47
L_{Aeq}	(see note 6)	59	71	75

Night Time Maximum Noise Levels			(see note 7)
L_{AFMax} (Range)	72	to	104
L_{AFMax} - L_{Aeq} (Range)	20	to	35

NSW Road Noise Policy (1m from facade)		
Descriptor	**Day**	**Night**[5]
	7am-10pm	**10pm-7am**
$L_{Aeq\ 15\ hr}$ and $L_{Aeq\ 9\ hr}$	69	78
$L_{Aeq\ 1hr}$ upper 10 percentile	70	82
$L_{Aeq\ 1hr}$ lower 10 percentile	60	53

Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Day" is the period from 8am till 6pm on Sundays and 7am till 6pm on other days
3. "Evening" is the period from 6pm till 10pm
4. "Night" relates to the remaining periods
5. "Night" relates to period from 10pm on this graph to morning on the following graph.
6. Graphed data measured 1m from facade; tabulated results free-field corrected
7. 1-hour values for L_{AFMax} are shown only where L_{AFMax} >65dB(A) and where L_{AFMax}- L_{Aeq} ≥15dB(A)

Data File: 2021-10-27_SLM_000_123_Rpt_Report.txt

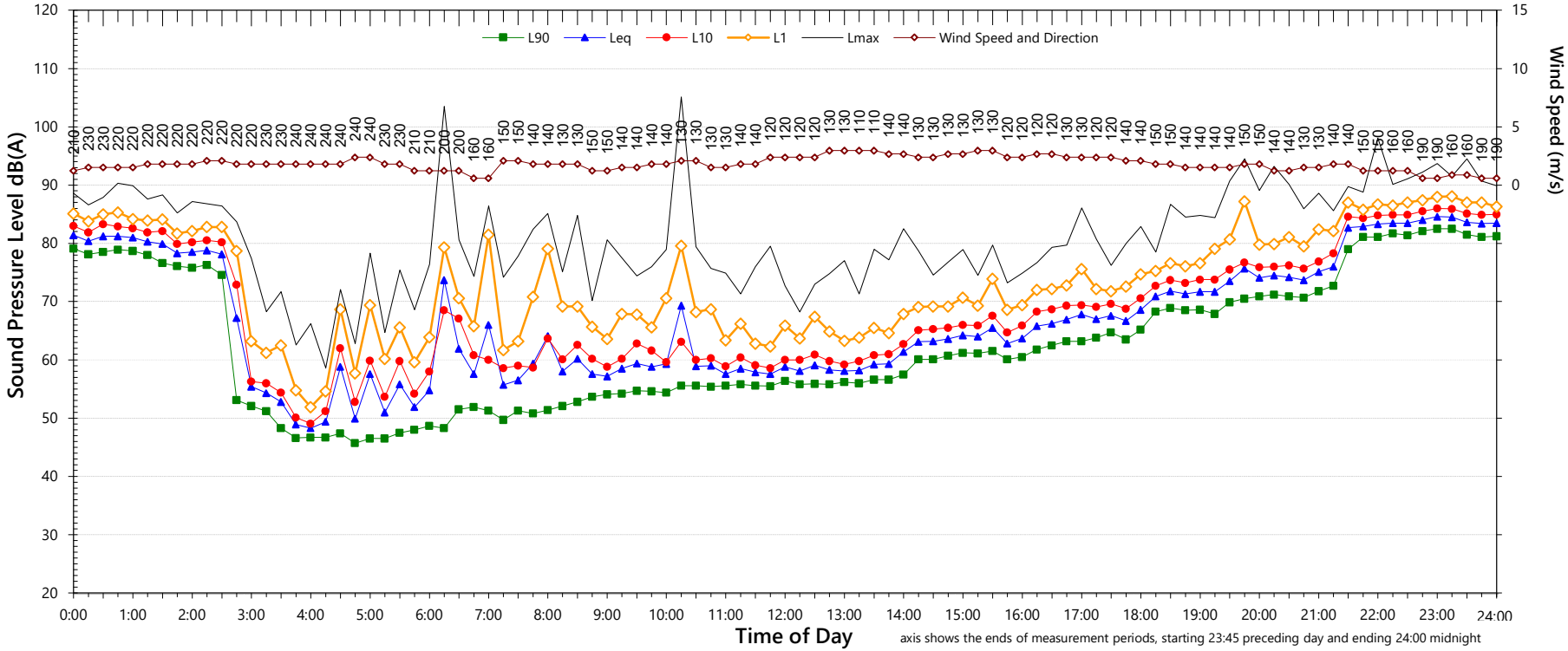
TM424-01L01 rear boundary facing market place (r0)

QTE-26 Logger Graphs Program (r38)

Unattended Noise Monitoring Results

Rear Boundary Facing Market Place

Saturday, 30 October 2021



NSW Noise Policy for Industry (Free Field)				
Descriptor		**Day**[2]	**Evening**[3]	**Night**[4 5]
L_{A90} ABL		52	68	49
L_{Aeq}	(see note 6)	61	75	78

Night Time Maximum Noise Levels			(see note 7)
L_{AFMax} (Range)	78	to	86
L_{AFMax} - L_{Aeq} (Range)	19	to	25

NSW Road Noise Policy (1m from facade)		
Descriptor	**Day**	**Night**[5]
	7am-10pm	**10pm-7am**
$L_{Aeq\ 15\ hr}$ and $L_{Aeq\ 9\ hr}$	72	81
$L_{Aeq\ 1hr}$ upper 10 percentile	74	84
$L_{Aeq\ 1hr}$ lower 10 percentile	58	60

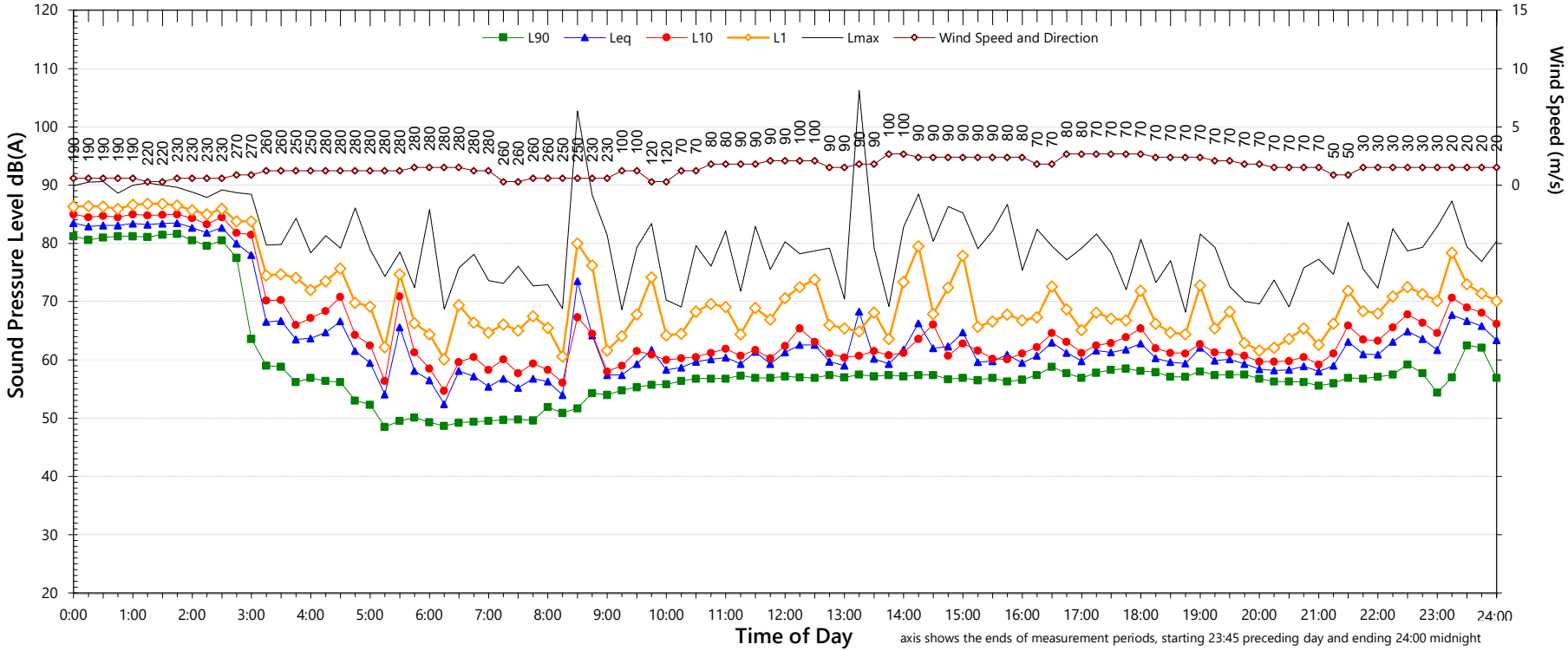
Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Day" is the period from 8am till 6pm on Sundays and 7am till 6pm on other days
3. "Evening" is the period from 6pm till 10pm
4. "Night" relates to the remaining periods
5. "Night" relates to period from 10pm on this graph to morning on the following graph.
6. Graphed data measured 1m from facade; tabulated results free-field corrected
7. 1-hour values for L_{AFMax} are shown only where L_{AFMax} >65dB(A) and where L_{AFMax}- L_{Aeq} ≥15dB(A)

Unattended Noise Monitoring Results

Rear Boundary Facing Market Place

Sunday, 31 October 2021



NSW Noise Policy for Industry (Free Field)				
Descriptor		**Day**[2]	**Evening**[3]	**Night**[4 5]
L_{A90} ABL		55	56	44
L_{Aeq}	(see note 6)	60	58	58

Night Time Maximum Noise Levels			(see note 7)
L_{AFMax} (Range)	69	to	87
L_{AFMax} - L_{Aeq} (Range)	17	to	30

NSW Road Noise Policy (1m from facade)		
Descriptor	**Day**	**Night**[5]
	7am-10pm	**10pm-7am**
$L_{Aeq\ 15\ hr}$ and $L_{Aeq\ 9\ hr}$	62	60
$L_{Aeq\ 1hr}$ upper 10 percentile	64	64
$L_{Aeq\ 1hr}$ lower 10 percentile	59	46

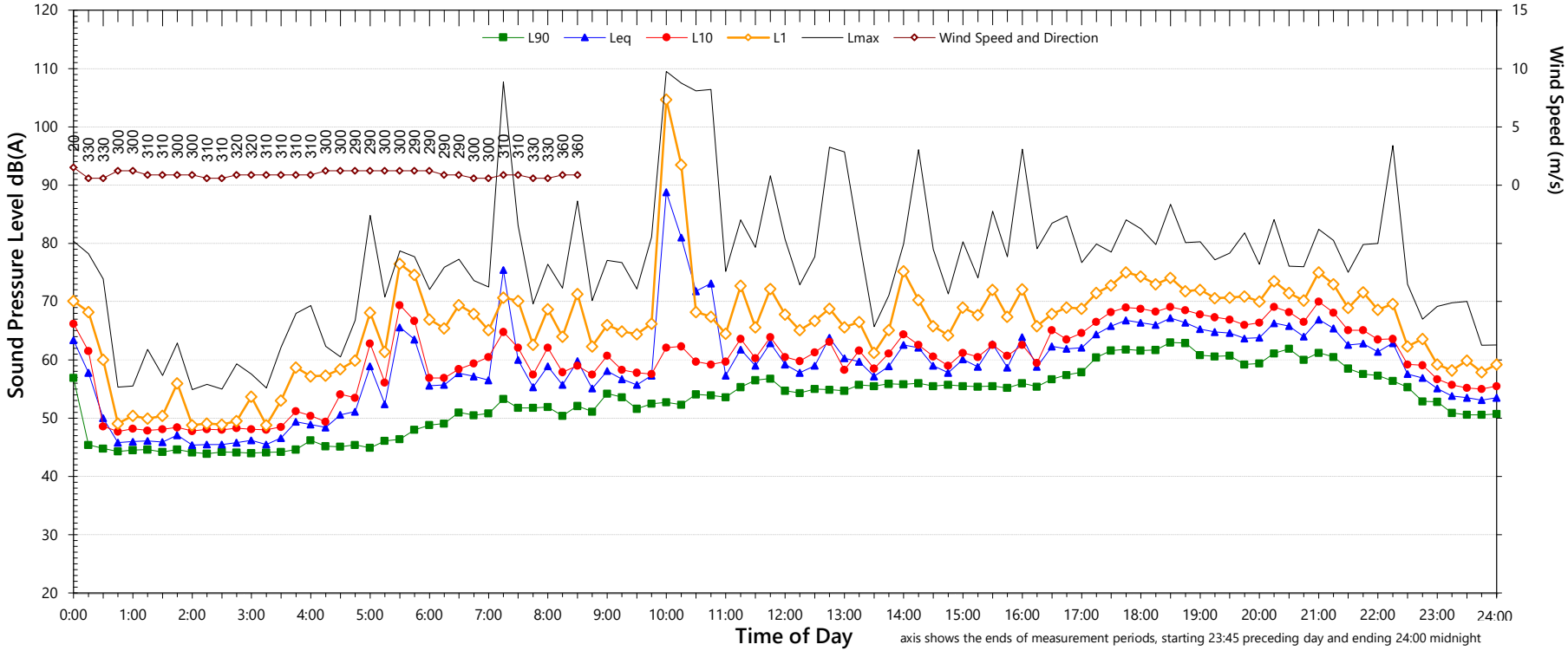
Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Day" is the period from 8am till 6pm on Sundays and 7am till 6pm on other days
3. "Evening" is the period from 6pm till 10pm
4. "Night" relates to the remaining periods
5. "Night" relates to period from 10pm on this graph to morning on the following graph.
6. Graphed data measured 1m from facade; tabulated results free-field corrected
7. 1-hour values for L_{AFMax} are shown only where L_{AFMax} >65dB(A) and where L_{AFMax}- L_{Aeq} ≥15dB(A)

Unattended Noise Monitoring Results

Rear Boundary Facing Market Place

Monday, 1 November 2021



NSW Noise Policy for Industry (Free Field)				
Descriptor		**Day**[2]	**Evening**[3]	**Night**[4 5]
L_{A90} ABL		52	58	45
L_{Aeq}	(see note 6)	71	63	55

Night Time Maximum Noise Levels			(see note 7)
L_{AFMax} (Range)	67	to	100
L_{AFMax} - L_{Aeq} (Range)	15	to	43

NSW Road Noise Policy (1m from facade)		
Descriptor	**Day**	**Night**[5]
	7am-10pm	**10pm-7am**
$L_{Aeq\ 15\ hr}$ and $L_{Aeq\ 9\ hr}$	72	57
$L_{Aeq\ 1hr}$ upper 10 percentile	73	60
$L_{Aeq\ 1hr}$ lower 10 percentile	60	52

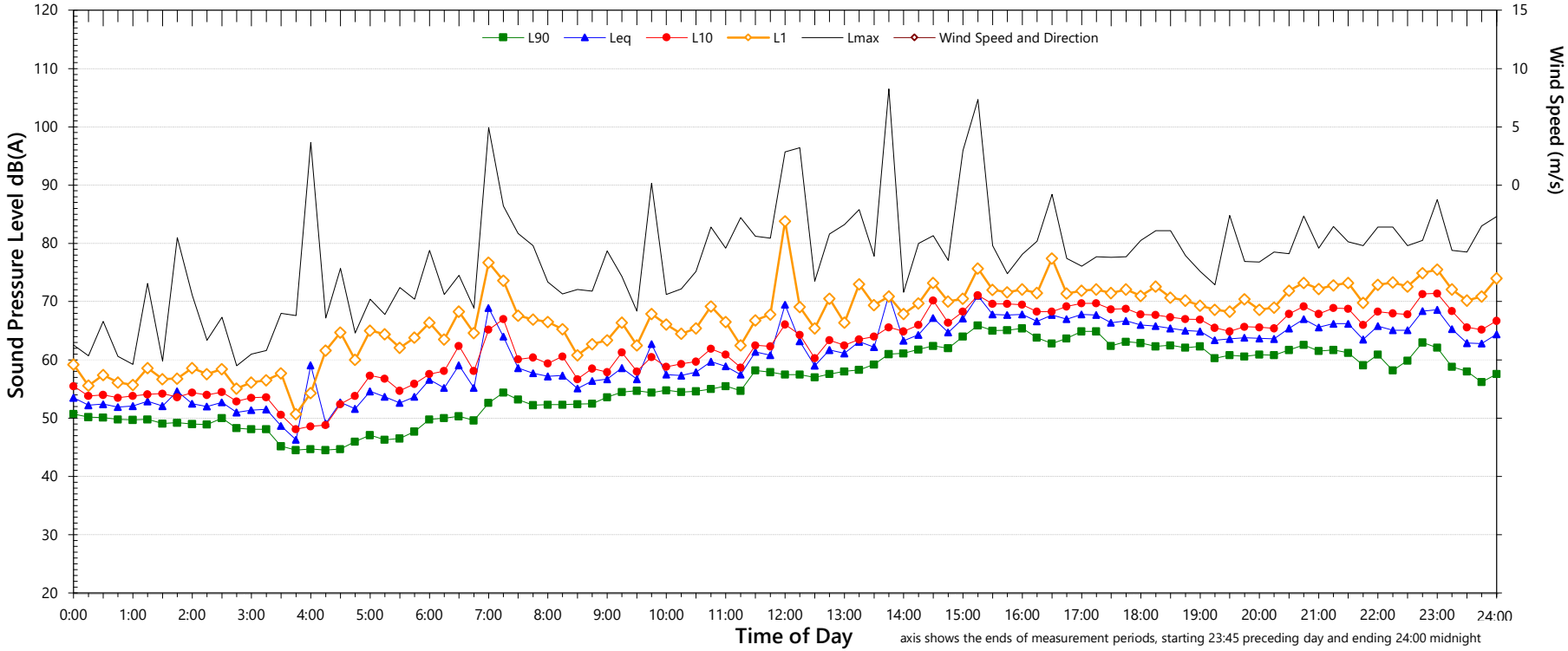
Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Day" is the period from 8am till 6pm on Sundays and 7am till 6pm on other days
3. "Evening" is the period from 6pm till 10pm
4. "Night" relates to the remaining periods
5. "Night" relates to period from 10pm on this graph to morning on the following graph.
6. Graphed data measured 1m from facade; tabulated results free-field corrected
7. 1-hour values for L_{AFMax} are shown only where L_{AFMax} >65dB(A) and where L_{AFMax}- L_{Aeq} ≥15dB(A)

Unattended Noise Monitoring Results

Rear Boundary Facing Market Place

Tuesday, 2 November 2021



NSW Noise Policy for Industry (Free Field)				
Descriptor		**Day[2]**	**Evening[3]**	**Night[4 5]**
L_{A90} ABL		53	60	50
L_{Aeq}	(see note 6)	62	63	62

Night Time Maximum Noise Levels			(see note 7)
L_{AFMax} (Range)	82	to	107
L_{AFMax} - L_{Aeq} (Range)	18	to	43

NSW Road Noise Policy (1m from facade)		
Descriptor	**Day**	**Night[5]**
	7am-10pm	**10pm-7am**
$L_{Aeq\ 15\ hr}$ and $L_{Aeq\ 9\ hr}$	65	65
$L_{Aeq\ 1hr}$ upper 10 percentile	67	67
$L_{Aeq\ 1hr}$ lower 10 percentile	59	58

Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Day" is the period from 8am till 6pm on Sundays and 7am till 6pm on other days
3. "Evening" is the period from 6pm till 10pm
4. "Night" relates to the remaining periods
5. "Night" relates to period from 10pm on this graph to morning on the following graph.
6. Graphed data measured 1m from facade; tabulated results free-field corrected
7. 1-hour values for L_{AFMax} are shown only where L_{AFMax} >65dB(A) and where L_{AFMax}- L_{Aeq} ≥15dB(A)

Data File: 2021-10-27_SLM_000_123_Rpt_Report.txt

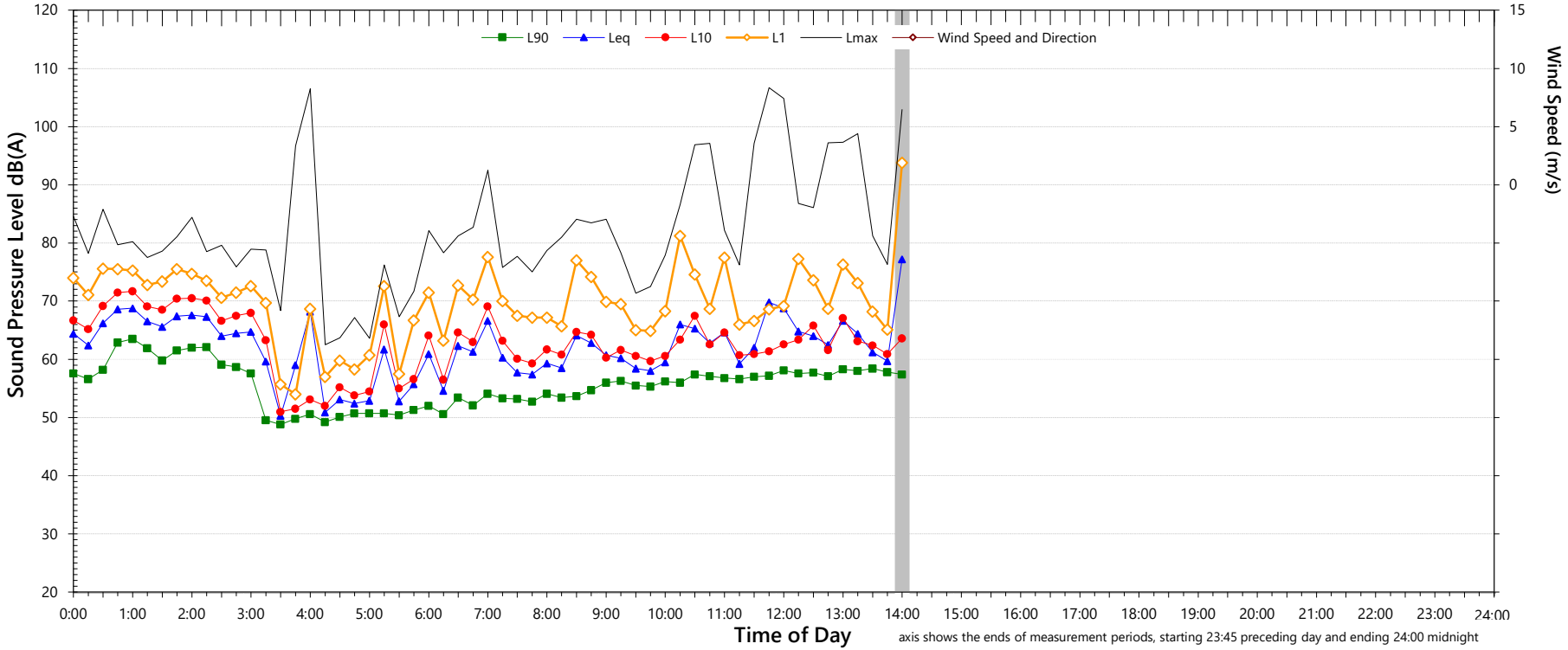
TM424-01L01 rear boundary facing market place (r0)

QTE-26 Logger Graphs Program (r38)

Unattended Noise Monitoring Results

Rear Boundary Facing Market Place

Wednesday, 3 November 2021



NSW Noise Policy for Industry (Free Field)				
Descriptor		**Day**[2]	**Evening**[3]	**Night**[4 5]
L_{A90} ABL		-	-	-
L_{Aeq}	(see note 6)	-	-	-

Night Time Maximum Noise Levels			**(see note 7)**
L_{AFMax} (Range)	-	to	-
L_{AFMax} - L_{Aeq} (Range)	-	to	-

NSW Road Noise Policy (1m from facade)		
Descriptor	**Day**	**Night**[5]
	7am-10pm	**10pm-7am**
$L_{Aeq\ 15\ hr}$ and $L_{Aeq\ 9\ hr}$	-	-
$L_{Aeq\ 1hr}$ upper 10 percentile	-	-
$L_{Aeq\ 1hr}$ lower 10 percentile	-	-

Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Day" is the period from 8am till 6pm on Sundays and 7am till 6pm on other days
3. "Evening" is the period from 6pm till 10pm
4. "Night" relates to the remaining periods
5. "Night" relates to period from 10pm on this graph to morning on the following graph.
6. Graphed data measured 1m from facade; tabulated results free-field corrected
7. 1-hour values for L_{AFMax} are shown only where L_{AFMax} >65dB(A) and where L_{AFMax} - L_{Aeq} ≥15dB(A)

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Front Facade Facing The Corso

Background & Ambient Noise Monitoring Results - NSW 'Noise Policy for Industry', 2017

Periods with insufficient results excluded	L_{A90} Background Noise Levels[4]			L_{Aeq} Ambient Noise Levels		
Date	**Day[1]**	**Evening[2]**	**Night[3]**	**Day[1]**	**Evening[2]**	**Night[3]**
Wednesday-27-October-2021	-	50	44	-	57	55
Thursday-28-October-2021	56	55	45	58	58	54
Friday-29-October-2021	55	58	47	61	60	60
Saturday-30-October-2021	55	58	47	60	62	60
Sunday-31-October-2021	55	56	44	59	58	55
Monday-01-November-2021	55	51	45	58	56	57
Tuesday-02-November-2021	55	54	46	62	58	55
Wednesday-03-November-2021	-	-	-	-	-	-
Representative Weekday[5]	**55**	**54**	**45**	**60**	**58**	**57**
Representative Weekend[5]	**55**	**57**	**46**	**59**	**61**	**58**
Representative Week[5]	**55**	**55**	**45**	**60**	**59**	**57**

Notes:

1. Day is 7:00am to 6:00pm on all days except Sundays and Public Holidays when it is 8:00am to 6:00pm 2. Evening is 6:00pm to 10:00pm

3. Night is the remaining periods 4. Assessment Background Level (ABL) for individual days 5. Rating Background Level (RBL) for L_{A90} and logarithmic average for L_{Aeq} 6. Leq is calculated in the free field. 2.5dB is subtracted from results if logger is placed at façade 7. Number in brackets represents the measured (actual) RBL value, which is below the minimum policy value of 30 dB(A) during the evening or night period or 35 dB(A) during the day period.

Front Facade Facing The Corso

Road / Rail Noise Monitoring Results (at one metre from façade)

Periods with insufficient results excluded	L_{Aeq} Noise Levels		$L_{Aeq\ 1hr}$ Noise Levels			
Date	**Day[1]**	**Night[2]**	**Day - Up[4]**	**Day - Low[5]**	**Night - Up[4]**	**Night - Low[5]**
Wednesday-27-October-2021	-	58	-	-	62	47
Thursday-28-October-2021	61	57	62	60	60	49
Friday-29-October-2021	64	62	64	60	64	57
Saturday-30-October-2021	63	63	65	60	65	59
Sunday-31-October-2021	61	57	62	59	61	47
Monday-01-November-2021	60	59	62	58	61	47
Tuesday-02-November-2021	64	58	68	60	61	51
Wednesday-03-November-2021	-	-	-	-	-	-
Representative Weekday[3]	**62**	**58**	**63**	**60**	**61**	**49**
Representative Weekend[3]	**62**	**60**	**64**	**60**	**63**	**53**
Representative Week[3]	**62**	**58**	**63**	**60**	**61**	**49**

Notes:

1. Day is 7:00am to 10:00pm 2. Night is 10:00pm to 7:00am 3. Median of daily L_{Aeq}

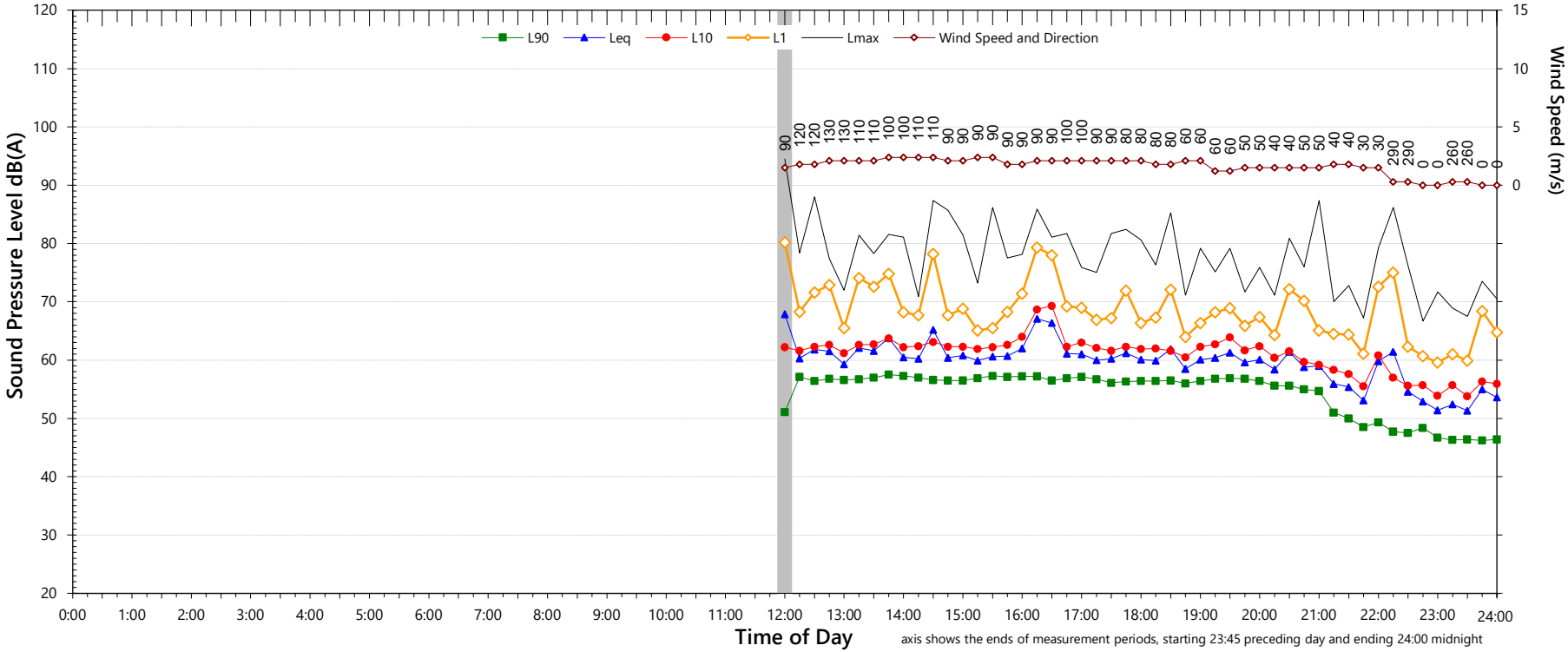
4. Upper 10th percentile $L_{Aeq\ 1hr}$ 5. Lower 10th percentile $L_{Aeq\ 1hr}$

6. Values are calculated at the facade. 2.5dB is added to results if logger is placed in the free field

Unattended Noise Monitoring Results

Front Facade Facing The Corso

Wednesday, 27 October 2021



NSW Noise Policy for Industry (Free Field)				
Descriptor		**Day**[2]	**Evening**[3]	**Night**[4 5]
L_{A90} ABL		-	50	44
L_{Aeq}	(see note 6)	-	57	55

Night Time Maximum Noise Levels			**(see note 7)**
L_{AFMax} (Range)	71	to	98
L_{AFMax} - L_{Aeq} (Range)	15	to	35

NSW Road Noise Policy (1m from facade)		
Descriptor	**Day**	**Night**[5]
	7am-10pm	**10pm-7am**
$L_{Aeq\ 15\ hr}$ and $L_{Aeq\ 9\ hr}$	-	58
$L_{Aeq\ 1hr}$ upper 10 percentile	-	62
$L_{Aeq\ 1hr}$ lower 10 percentile	-	47

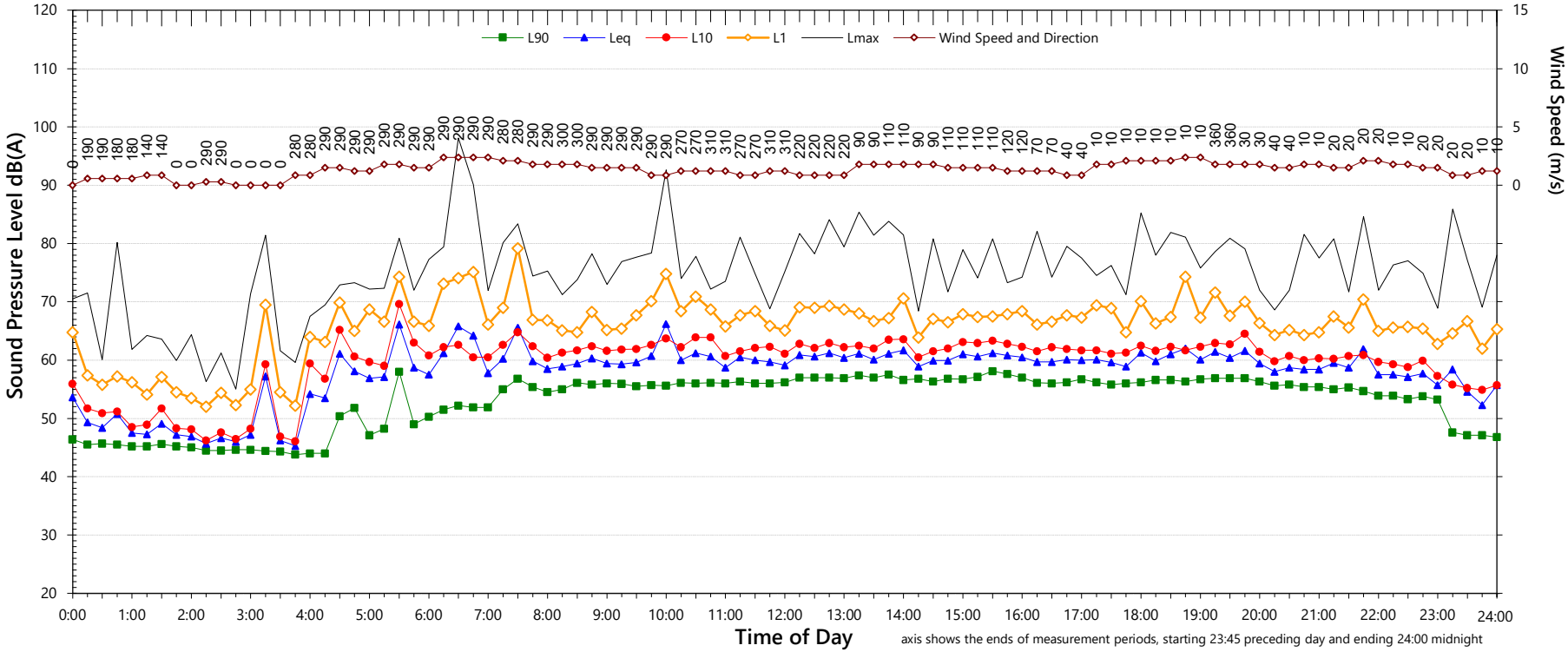
Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Day" is the period from 8am till 6pm on Sundays and 7am till 6pm on other days
3. "Evening" is the period from 6pm till 10pm
4. "Night" relates to the remaining periods
5. "Night" relates to period from 10pm on this graph to morning on the following graph.
6. Graphed data measured 1m from facade; tabulated results free-field corrected
7. 1-hour values for L_{AFMax} are shown only where L_{AFMax} >65dB(A) and where L_{AFMax}- L_{Aeq} ≥15dB(A)

Unattended Noise Monitoring Results

Front Facade Facing The Corso

Thursday, 28 October 2021



NSW Noise Policy for Industry (Free Field)				
Descriptor		**Day**[2]	**Evening**[3]	**Night**[4 5]
L_{A90} ABL		56	55	45
L_{Aeq}	(see note 6)	58	58	54

Night Time Maximum Noise Levels			(see note 7)
L_{AFMax} (Range)	66	to	86
L_{AFMax} - L_{Aeq} (Range)	15	to	30

NSW Road Noise Policy (1m from facade)		
Descriptor	**Day**	**Night**[5]
	7am-10pm	**10pm-7am**
$L_{Aeq\ 15\ hr}$ and $L_{Aeq\ 9\ hr}$	61	57
$L_{Aeq\ 1hr}$ upper 10 percentile	62	60
$L_{Aeq\ 1hr}$ lower 10 percentile	60	49

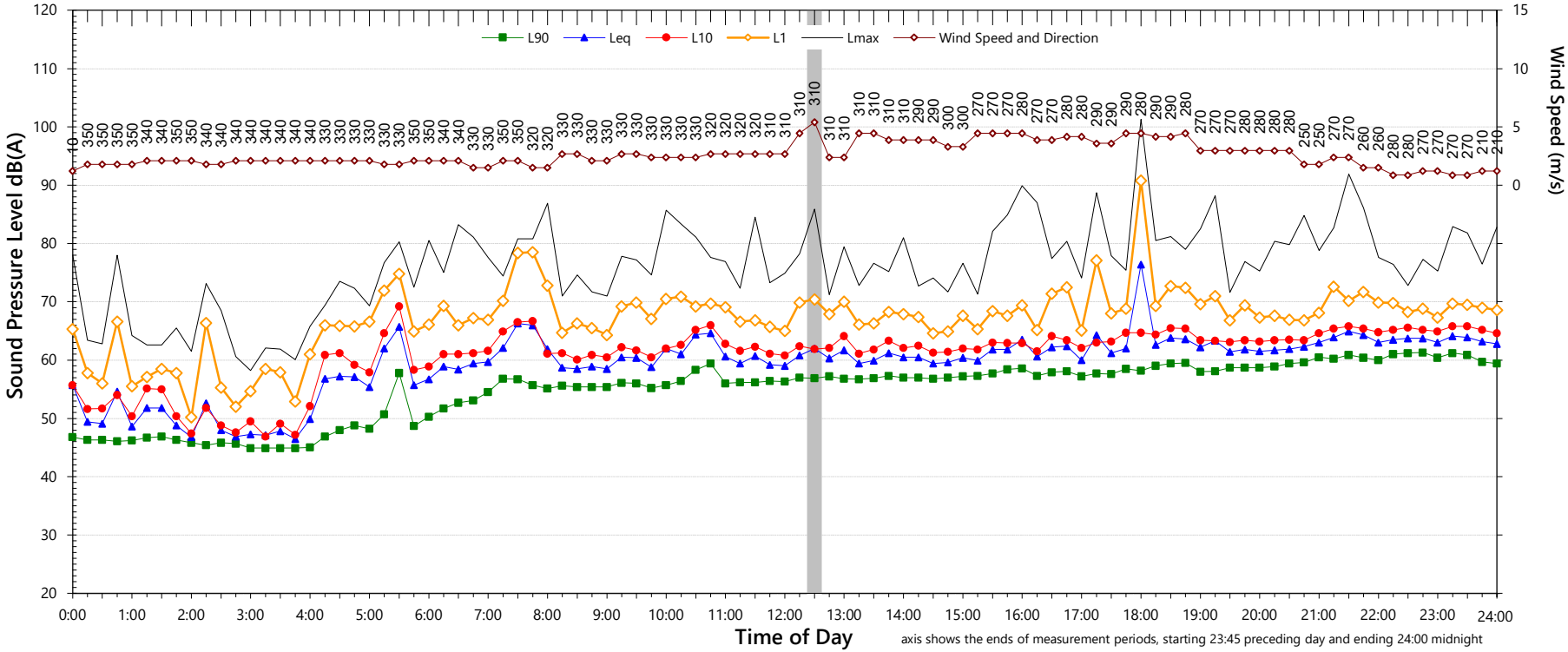
Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Day" is the period from 8am till 6pm on Sundays and 7am till 6pm on other days
3. "Evening" is the period from 6pm till 10pm
4. "Night" relates to the remaining periods
5. "Night" relates to period from 10pm on this graph to morning on the following graph.
6. Graphed data measured 1m from facade; tabulated results free-field corrected
7. 1-hour values for L_{AFMax} are shown only where L_{AFMax} >65dB(A) and where L_{AFMax}- L_{Aeq} ≥15dB(A)

Unattended Noise Monitoring Results

Front Facade Facing The Corso

Friday, 29 October 2021



NSW Noise Policy for Industry (Free Field)				
Descriptor		**Day**[2]	**Evening**[3]	**Night**[4 5]
L_{A90} ABL		55	58	47
L_{Aeq}	(see note 6)	61	60	60

Night Time Maximum Noise Levels			(see note 7)
L_{AFMax} (Range)	70	to	90
L_{AFMax} - L_{Aeq} (Range)	16	to	29

NSW Road Noise Policy (1m from facade)		
Descriptor	**Day**	**Night**[5]
	7am-10pm	**10pm-7am**
$L_{Aeq\ 15\ hr}$ and $L_{Aeq\ 9\ hr}$	64	62
$L_{Aeq\ 1hr}$ upper 10 percentile	64	64
$L_{Aeq\ 1hr}$ lower 10 percentile	60	57

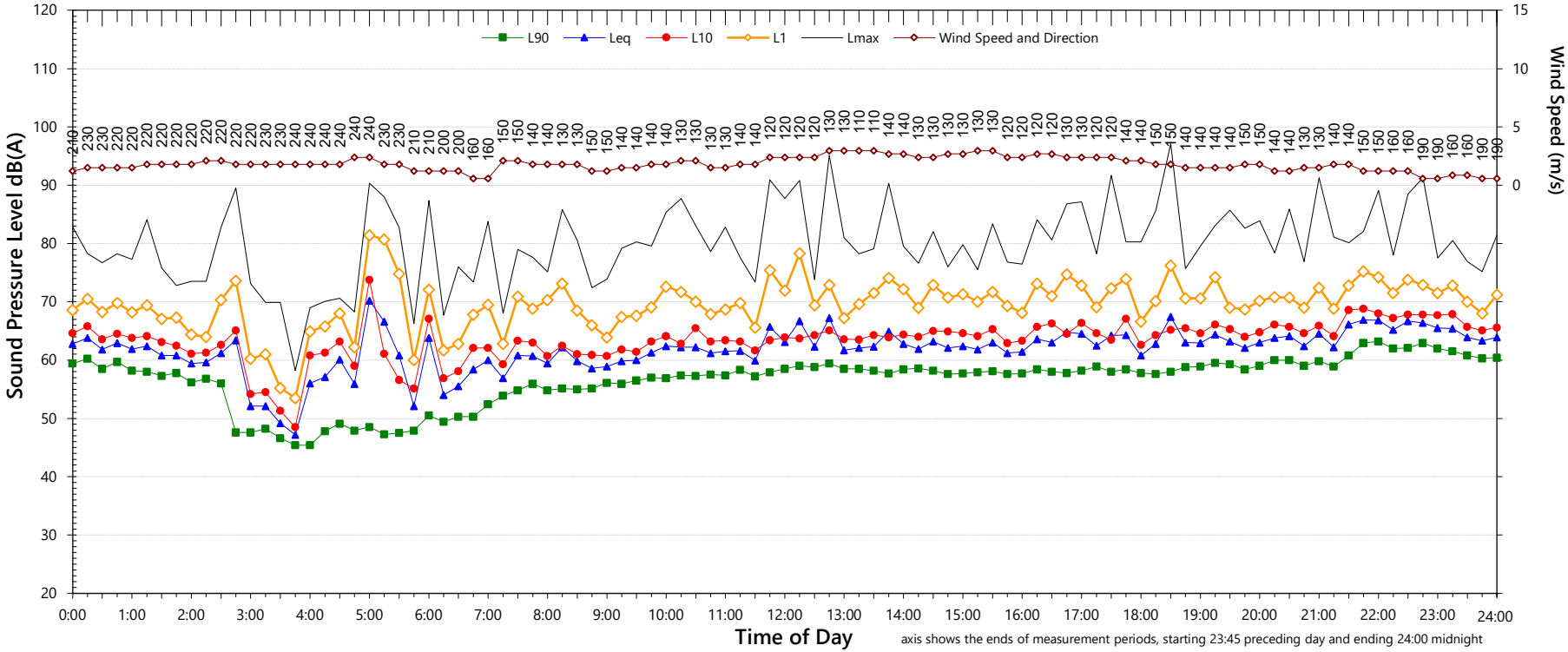
Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Day" is the period from 8am till 6pm on Sundays and 7am till 6pm on other days
3. "Evening" is the period from 6pm till 10pm
4. "Night" relates to the remaining periods
5. "Night" relates to period from 10pm on this graph to morning on the following graph.
6. Graphed data measured 1m from facade; tabulated results free-field corrected
7. 1-hour values for L_{AFMax} are shown only where L_{AFMax} >65dB(A) and where L_{AFMax}- L_{Aeq} ≥15dB(A)

Unattended Noise Monitoring Results

Front Facade Facing The Corso

Saturday, 30 October 2021



axis shows the ends of measurement periods, starting 23:45 preceding day and ending 24:00 midnight

NSW Noise Policy for Industry (Free Field)				
Descriptor		**Day**[2]	**Evening**[3]	**Night**[4 5]
L_{A90} ABL		55	58	47
L_{Aeq}	(see note 6)	60	62	60

Night Time Maximum Noise Levels			(see note 7)
L_{AFMax} (Range)	79	to	93
L_{AFMax} - L_{Aeq} (Range)	16	to	33

NSW Road Noise Policy (1m from facade)		
Descriptor	**Day**	**Night**[5]
	7am-10pm	**10pm-7am**
$L_{Aeq\ 15\ hr}$ and $L_{Aeq\ 9\ hr}$	63	63
$L_{Aeq\ 1hr}$ upper 10 percentile	65	65
$L_{Aeq\ 1hr}$ lower 10 percentile	60	59

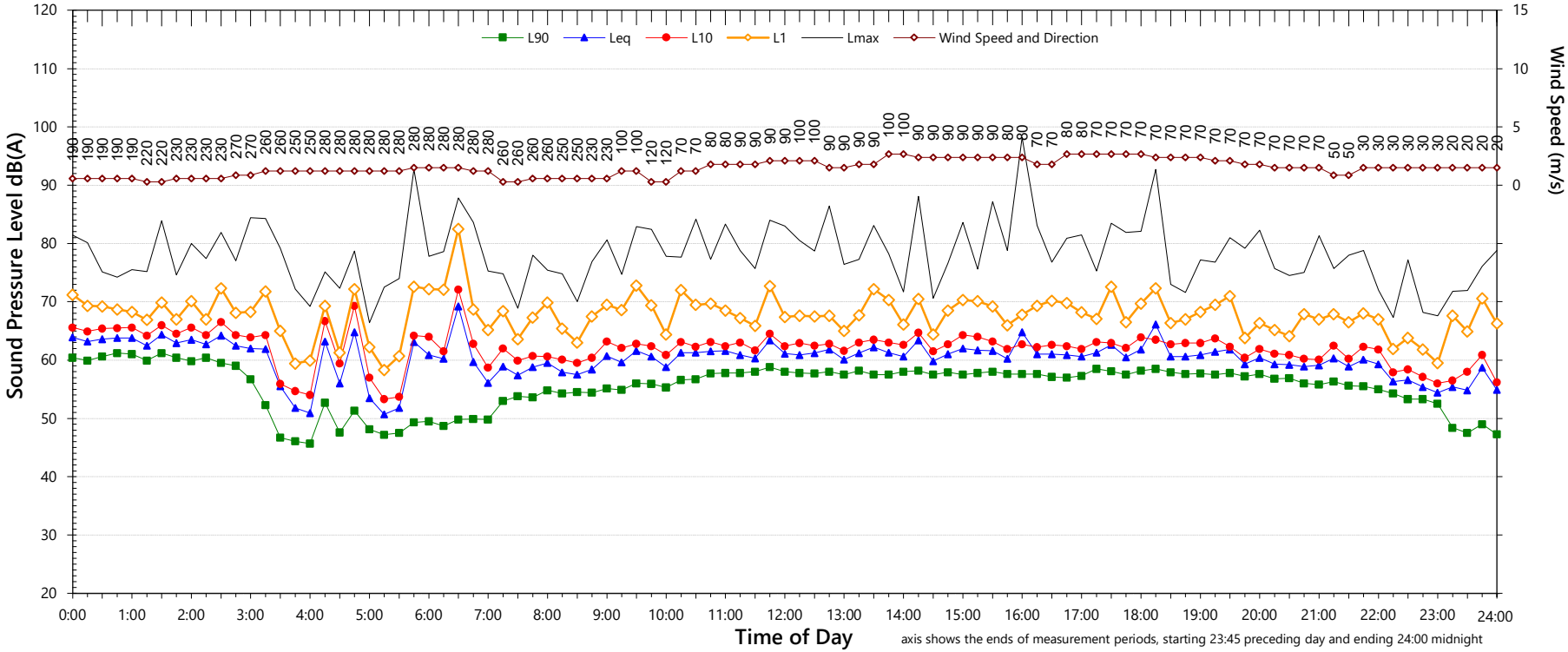
Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Day" is the period from 8am till 6pm on Sundays and 7am till 6pm on other days
3. "Evening" is the period from 6pm till 10pm
4. "Night" relates to the remaining periods
5. "Night" relates to period from 10pm on this graph to morning on the following graph.
6. Graphed data measured 1m from facade; tabulated results free-field corrected
7. 1-hour values for L_{AFMax} are shown only where L_{AFMax} >65dB(A) and where L_{AFMax}- L_{Aeq} ≥15dB(A)

Unattended Noise Monitoring Results

Front Facade Facing The Corso

Sunday, 31 October 2021



axis shows the ends of measurement periods, starting 23:45 preceding day and ending 24:00 midnight

NSW Noise Policy for Industry (Free Field)				
Descriptor		**Day**[2]	**Evening**[3]	**Night**[4 5]
L_{A90} ABL		55	56	44
L_{Aeq}	(see note 6)	59	58	55

Night Time Maximum Noise Levels			(see note 7)
L_{AFMax} (Range)	66	to	84
L_{AFMax} - L_{Aeq} (Range)	16	to	27

NSW Road Noise Policy (1m from facade)		
Descriptor	**Day**	**Night**[5]
	7am-10pm	**10pm-7am**
$L_{Aeq\ 15\ hr}$ and $L_{Aeq\ 9\ hr}$	61	57
$L_{Aeq\ 1hr}$ upper 10 percentile	62	61
$L_{Aeq\ 1hr}$ lower 10 percentile	59	47

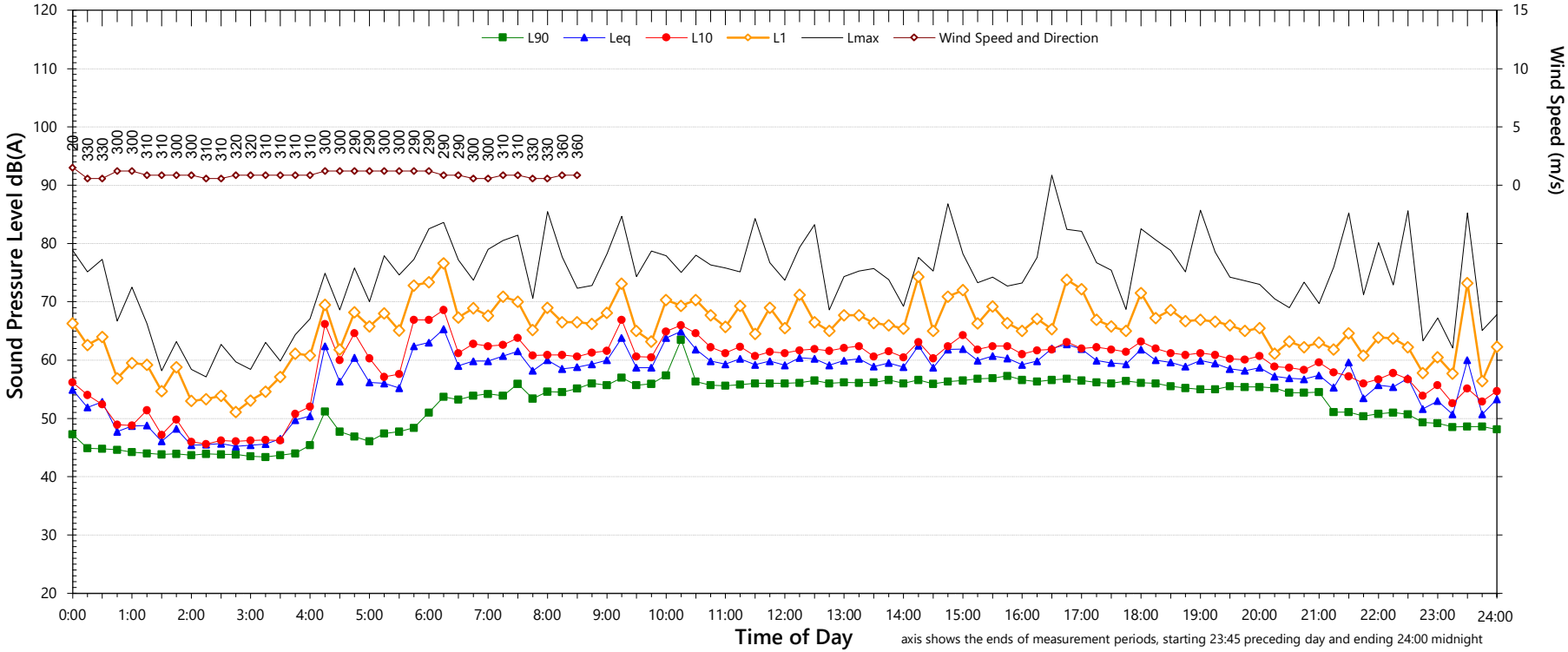
Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Day" is the period from 8am till 6pm on Sundays and 7am till 6pm on other days
3. "Evening" is the period from 6pm till 10pm
4. "Night" relates to the remaining periods
5. "Night" relates to period from 10pm on this graph to morning on the following graph.
6. Graphed data measured 1m from facade; tabulated results free-field corrected
7. 1-hour values for L_{AFMax} are shown only where L_{AFMax} >65dB(A) and where L_{AFMax}- L_{Aeq} ≥15dB(A)

Unattended Noise Monitoring Results

Front Facade Facing The Corso

Monday, 1 November 2021



NSW Noise Policy for Industry (Free Field)				
Descriptor		**Day**[2]	**Evening**[3]	**Night**[4 5]
L_{A90} ABL		55	51	45
L_{Aeq}	(see note 6)	58	56	57

Night Time Maximum Noise Levels			**(see note 7)**
L_{AFMax} (Range)	66	to	90
L_{AFMax} - L_{Aeq} (Range)	16	to	31

NSW Road Noise Policy (1m from facade)		
Descriptor	**Day**	**Night**[5]
	7am-10pm	**10pm-7am**
$L_{Aeq\ 15\ hr}$ and $L_{Aeq\ 9\ hr}$	60	59
$L_{Aeq\ 1hr}$ upper 10 percentile	62	61
$L_{Aeq\ 1hr}$ lower 10 percentile	58	47

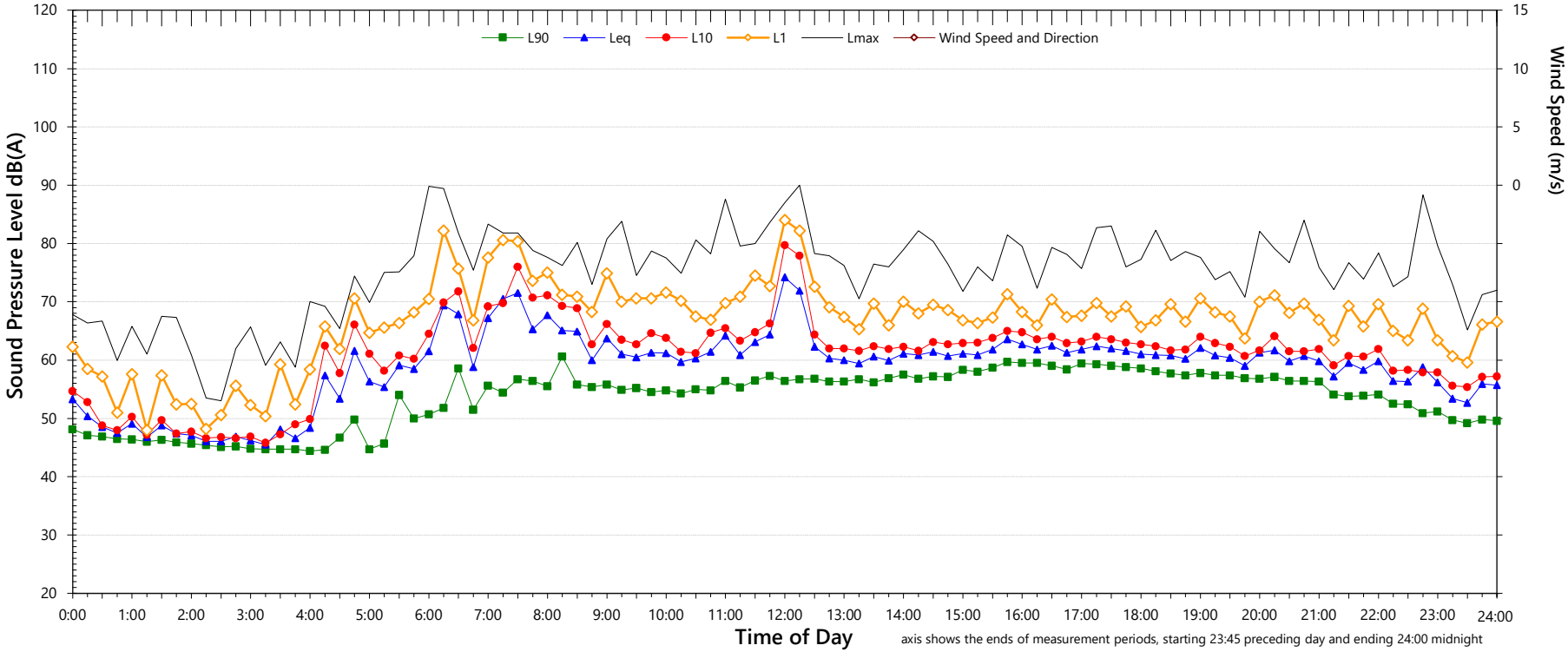
Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Day" is the period from 8am till 6pm on Sundays and 7am till 6pm on other days
3. "Evening" is the period from 6pm till 10pm
4. "Night" relates to the remaining periods
5. "Night" relates to period from 10pm on this graph to morning on the following graph.
6. Graphed data measured 1m from facade; tabulated results free-field corrected
7. 1-hour values for L_{AFMax} are shown only where L_{AFMax} >65dB(A) and where L_{AFMax}- L_{Aeq} ≥15dB(A)

Unattended Noise Monitoring Results

Front Facade Facing The Corso

Tuesday, 2 November 2021



NSW Noise Policy for Industry (Free Field)				
Descriptor		**Day**[2]	**Evening**[3]	**Night**[4 5]
L_{A90} ABL		55	54	46
L_{Aeq}	(see note 6)	62	58	55

Night Time Maximum Noise Levels			(see note 7)
L_{AFMax} (Range)	73	to	88
L_{AFMax} - L_{Aeq} (Range)	15	to	31

NSW Road Noise Policy (1m from facade)		
Descriptor	**Day**	**Night**[5]
	7am-10pm	**10pm-7am**
$L_{Aeq\ 15\ hr}$ and $L_{Aeq\ 9\ hr}$	64	58
$L_{Aeq\ 1hr}$ upper 10 percentile	68	61
$L_{Aeq\ 1hr}$ lower 10 percentile	60	51

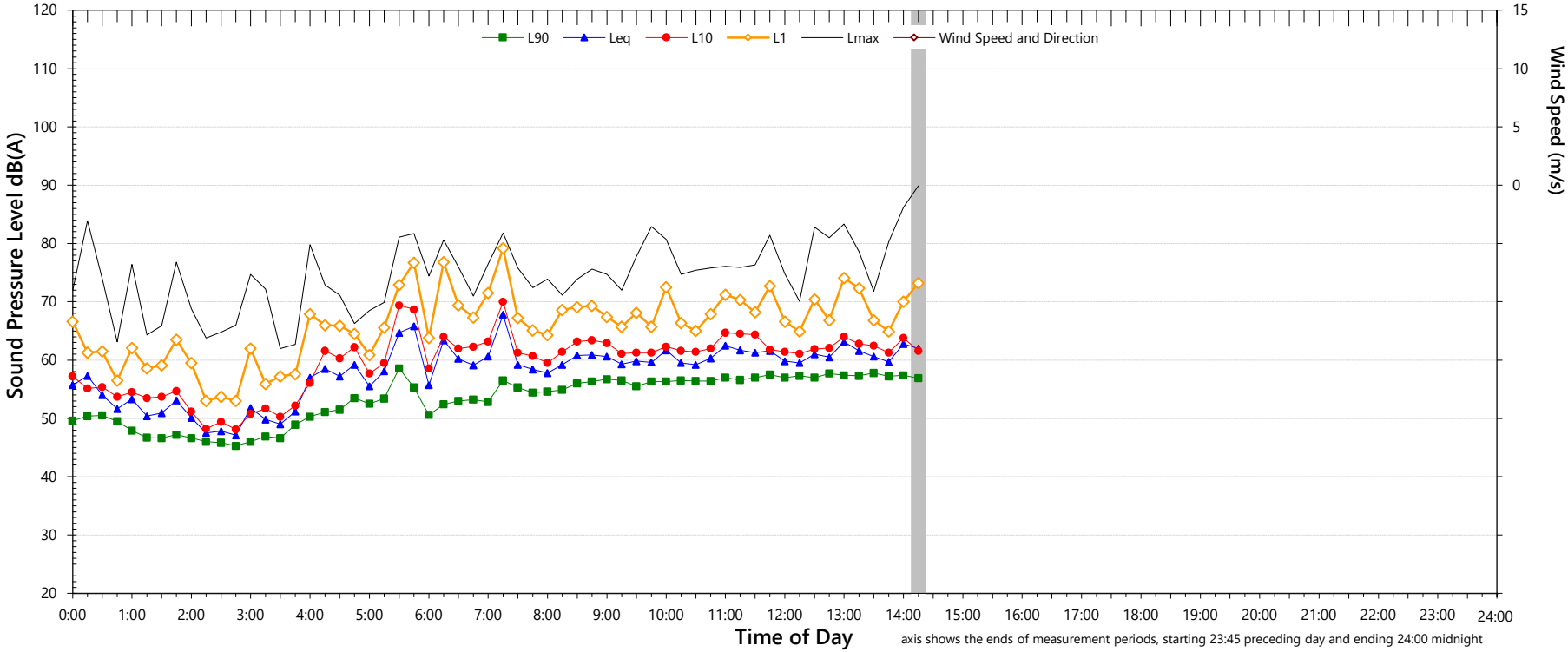
Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Day" is the period from 8am till 6pm on Sundays and 7am till 6pm on other days
3. "Evening" is the period from 6pm till 10pm
4. "Night" relates to the remaining periods
5. "Night" relates to period from 10pm on this graph to morning on the following graph.
6. Graphed data measured 1m from facade; tabulated results free-field corrected
7. 1-hour values for L_{AFMax} are shown only where L_{AFMax} >65dB(A) and where L_{AFMax}- L_{Aeq} ≥15dB(A)

Unattended Noise Monitoring Results

Front Facade Facing The Corso

Wednesday, 3 November 2021



NSW Noise Policy for Industry (Free Field)				
Descriptor		**Day**[2]	**Evening**[3]	**Night**[4 5]
L_{A90} ABL		-	-	-
L_{Aeq}	(see note 6)	-	-	-

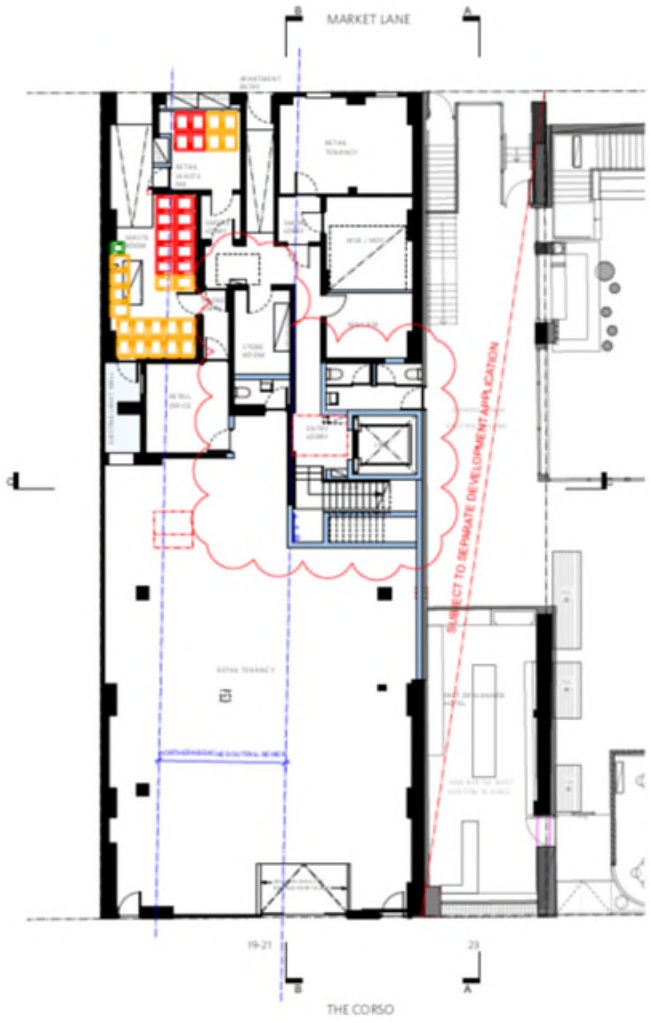
Night Time Maximum Noise Levels			(see note 7)
L_{AFMax} (Range)	-	to	-
L_{AFMax} - L_{Aeq} (Range)	-	to	-

NSW Road Noise Policy (1m from facade)		
Descriptor	**Day**	**Night**[5]
	7am-10pm	**10pm-7am**
$L_{Aeq\ 15\ hr}$ and $L_{Aeq\ 9\ hr}$	-	-
$L_{Aeq\ 1hr}$ upper 10 percentile	-	-
$L_{Aeq\ 1hr}$ lower 10 percentile	-	-

Notes:

1. Shaded periods denote measurements adversely affected by rain, wind or extraneous noise - data in these periods are excluded from calculations.
2. "Day" is the period from 8am till 6pm on Sundays and 7am till 6pm on other days
3. "Evening" is the period from 6pm till 10pm
4. "Night" relates to the remaining periods
5. "Night" relates to period from 10pm on this graph to morning on the following graph.
6. Graphed data measured 1m from facade; tabulated results free-field corrected
7. 1-hour values for L_{AFMax} are shown only where L_{AFMax} >65dB(A) and where L_{AFMax}- L_{Aeq} ≥15dB(A)

APPENDIX B Glazing Mark Up



GROUND FLOOR PLAN - PROPOSED

1ST FLOOR PLAN - PROPOSED

2ND FLOOR PLAN - PROPOSED

3RD FLOOR PLAN - PROPOSED