Mr Eton Huang

67 Mars Road, Lane Cove West

Acoustic DA Assessment

Author	Fu Siong Hie, B.Eng, MAAS Principal Consultant
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1 Introduction

The following report has been prepared by Acouras Consultancy on behalf of Mr Eton Huang to assess the potential for noise impact associated with the proposed business centre at 67 Mars Road, Lane Cove West. The commercial development will include:

- Three (3) levels of basement carpark and storage.
- Commercial units on level 1 (ground) and level 2.

The proposed commercial development is in a commercial zone and surrounded by other existing commercial and light industry buildings. The site location is shown in Figure 1.

Figure 1 – Site Location, Nearest Residents and Noise Logger Position

2 Noise Criteria

The following standards and guidelines are applicable to this project:

- NSW EPA "Noise Policy for Industry" (NPfI).
- Australian standard AS/NZS 2107-2016: Acoustics – Recommended design sound levels and reverberation times for building interiors.
- Australian standard AS 1055.1-1997: Acoustics – Description and measurement of environmental noise - General procedures.

2.1 Internal Noise Levels

Australian Standard AS 2107. Australian Standard AS 2107 – 2016 'Acoustic – Recommended Design Sound Levels and Reverberation Times for Building Interiors' provides the recommended design sound levels for different areas of occupancy in buildings. Table 1 presents the recommended internal design noise levels in accordance with AS 2107 – 2016.

Table 1— Recommended Internal Design Noise Levels (AS/NZS 2107)

Type of occupancy/activity	Design sound level ($L_{Aeq,t}$) range
Corridors and lobbies	45 to 50
Reception areas	40 to 45
Open plan office	40 to 45
General office	40 to 45
Toilets	45 to55
Enclosed/Undercover Carparks	< 65

2.2 Noise Survey and Project Specific Limits

An unattended noise survey was carried out at the site to measure the background and ambient noise levels. Noise monitoring was conducted between Thursday 8th to Thursday 15th July 2021. The noise monitor located at the corner of Mars and Orion Road as shown in Figure 1:

Measurements were conducted using the following equipment:

- SVAN 977 Type 1 Real time Analyser/Noise Logger. Serial No. 34892.
- SVAN SV30A Type 1 Sound Level Calibrator. Serial No. 31830.

Noise monitoring was conducted in general accordance with Australian standard AS 1055.1-1997: Acoustics-Description and measurement of environmental noise-General procedures.

The noise analyser was calibrated immediately before and after measurements were taken with no discernible differences between these two recorded levels. The sound analyser is Type 1 and complies with Australian standard AS1259.2: 1990.

During the monitoring period any adverse weather condition have been excluded. The noise logger results are presented in Appendix C.

2.2.1 Traffic Noise Results

Table 2 presents a summary of the measured morning peak traffic noise level impacting the proposed development.

Table 2 – Measured Ambient and Traffic Noise and Levels, dBA

Location	Period	Average L_{eq}	Highest L_{eq} 1hr
Crn Mars & Orion Rd	Day (07:00-22:00)	59	67
	Night (22:00-07:00)	55	63

2.2.2 EPA Noise Policy for Industry

Table 3 presents a summary of the measured background noise level and the allowable intrusive noise limit for this project based on the requirements of the EPA's 'Noise Policy for Industry' guideline. The amenity criteria are based on an urban receiver.

Table 3—Noise Survey Summary and Project Limits, dBA

Receiver	Time Period	Existing Noise Levels		NSW EPA NPfI			Project Noise Trigger Level $L_{eq(15min)}$
		L_{eq} (period)	RBL	ANL	Project ANL[1] $L_{eq(15min)}$	Intrusiveness Criteria, $L_{eq(15min)}$	
Residential	Day	60	46	60	58	51	**51**
	Evening	53	42	50	48	47	**47**
	Night	55	40	45	43	45	**43**
Commercial	When in use						**65**
Industrial	When in use						**70**

During detailed design stage, the design and selection of the mechanical equipment required to service the proposed development will be required to achieve the EPA noise limits as presented in the table above.

[1] Project ANL is recommended ANL minus 5 dB(A) and plus 3 dB(A), to convert from a period level to a 15-minute level.

3 Assessment and Recommendations

3.1 Façade Glazing Requirements

Acoustic glazing for the development are given in Table 4 are required to reduce noise impact on the internal occupants and should result in noise levels within such units in accordance with AS/NZS 2107.

Table 4 – Schedule of Window and Glazing (R_w)

Level	Space	Glazing Thickness	Minimum R_w (Glazing+Frame)
All	Commercial Suites	6.38mm laminated	30

All other non-habitable spaces, such as bathrooms and laundries require minimum 6mm monolithic glass (Rw 28).

All Windows/doors should be well sealed (air tight) when closed with good acoustic seals around the top and bottom sliders. Mohair seals are not considered to be acoustic seals.

3.2 Building Façade Construction

To provide sufficient acoustic attention of noise, the general external construction of the proposed building would need to be constructed as detailed in Table 5.

Table 5 – External Façade Construction (R_w)

Building Element	Proposed Construction	Minimum R_w
External Wall	Precast Concrete Panels with internal plasterboard cavity wall. Insulation in cavity as per thermal requirements.	45
Roof and ceiling	Concrete with a suspended plasterboard or mineral tile cavity ceiling. Insulation in cavity as per thermal requirements.	45

3.3 Mechanical Services

At the DA stage, the design and selection of mechanical equipment has not been finalised. Following the DA approval of the proposed development, during the Construction Certification Stage a detail assessment of all mechanical plant and equipment will be conducted to ensure compliance with the EPA and DCP noise criteria. Typical acoustic measures may include the construction of acoustic barriers, enclosures, attenuators and/or acoustic louvres.

4 Conclusion

An acoustic assessment of the proposed development has been carried out in accordance with the requirements of EPA noise guidelines and Australian Standards.

An environmental noise survey of the site has been conducted and the noise limiting criteria for mechanical plant/equipment noise emission has been determined based on the EPA NPfI. The limits are presented in Table 3.

Construction for glazing, external walls and the roof/ceiling systems have been provided to achieve the internal noise criteria and are detailed in Section 3.1 and Section 3.2 based on the impact of road traffic noise.

Providing the recommendations in this report are implemented, the noise from the proposed development is predicted to comply with acoustic requirements of the EPA noise guidelines and Australian Standards.

Appendix A – Acoustic Terminology

Decibel, dB: A dimensionless unit which denotes the ratio between two quantities that are proportional to power, energy or intensity. One of these quantities is a designated reference by which all other quantities of identical units are divided. The sound pressure level in decibels is equal to 10 times the logarithm (to the base 10) of the ratio between the pressure squared divided by the reference pressure squared. The reference pressure used in acoustics is 20 micro Pascals.

A-WEIGHTING: A measure of sound pressure level designed to reflect the response of the human ear, which does not respond equally to all frequencies. To describe sound in a manner representative of the human ear's response it is necessary to reduce the effects of the low and high frequencies with respect to medium frequencies. The resultant sound level is said to be A-weighted, and the units are in decibels (dBA). The A-weighted sound level is also called the noise level.

Sound Pressure Level, L p (dB), of a sound: 20 times the logarithm to the base 10 of the ratio of the r.m.s. sound pressure to the reference sound pressure of 20 micro Pascals. Sound pressure level is measured using a microphone and a sound level meter, and varies with distance from the source and the environment.

Ambient Noise/Sound: All noise level present in a given environment, usually being a composite of sounds from many sources far and near. Traffic, HVAC, masking sound or even low-level background music can contribute to ambient level of noise or sound.

Percentile Level - L 90 , L 10 , etc: A statistical measurement giving the sound pressure level which is exceeded for the given percentile of an observation period, e.g. L 90 is the level which is exceeded for 90% of a measurement period. L 90 is commonly referred to as the "background" sound level.

Background Noise (L 90): The sum total of all unwanted residual noise generated from all direct and reflected sound sources in a space that can represent an interface to, or interfere with good listening and speech intelligibility.

Rating Background Level – RBL: Method for determining the existing background noise level which involves calculating the tenth percentile from the L A90 measurements. This value gives the Assessment Background Noise Level (ABL). Rating Background Level is the median of the overall ABL.

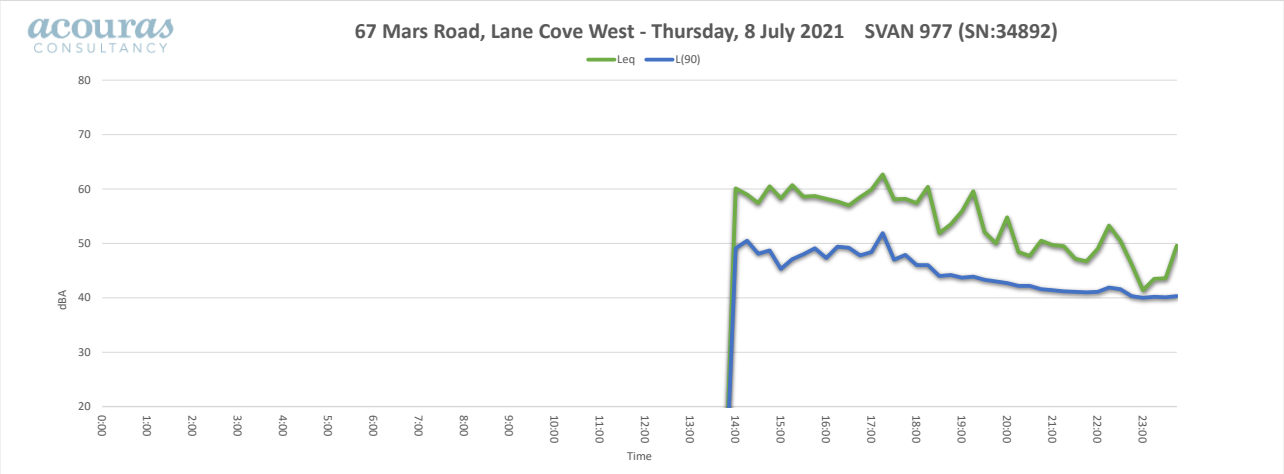
L AEQ,T : Equivalent continuous A-weighted sound pressure level. The value of the A-weighted sound pressure level of a continuous steady sound that, within a measurement time interval T, has the same A-weighted sound energy as the actual time-varying sound.

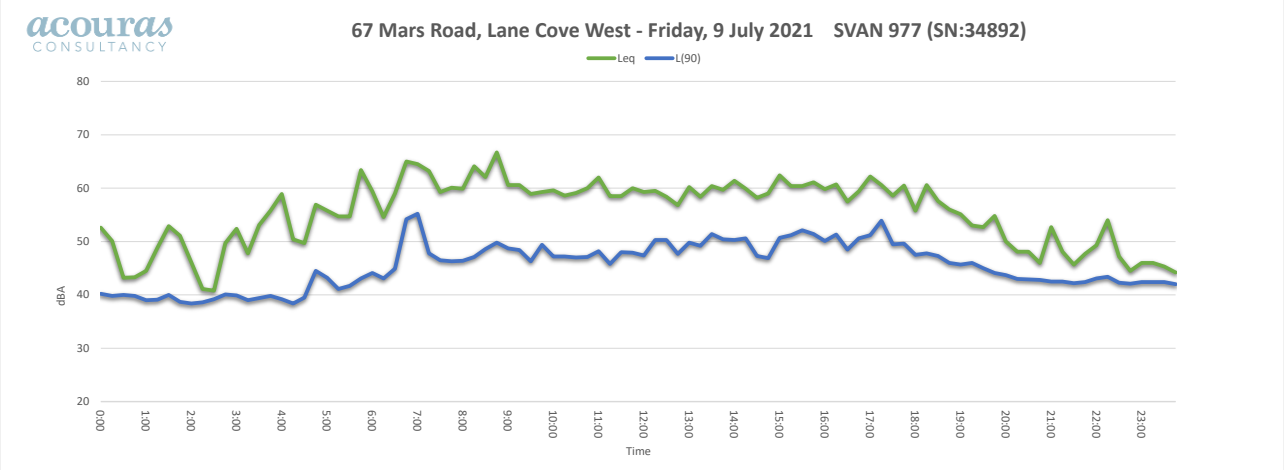
Appendix B – Architectural Drawings

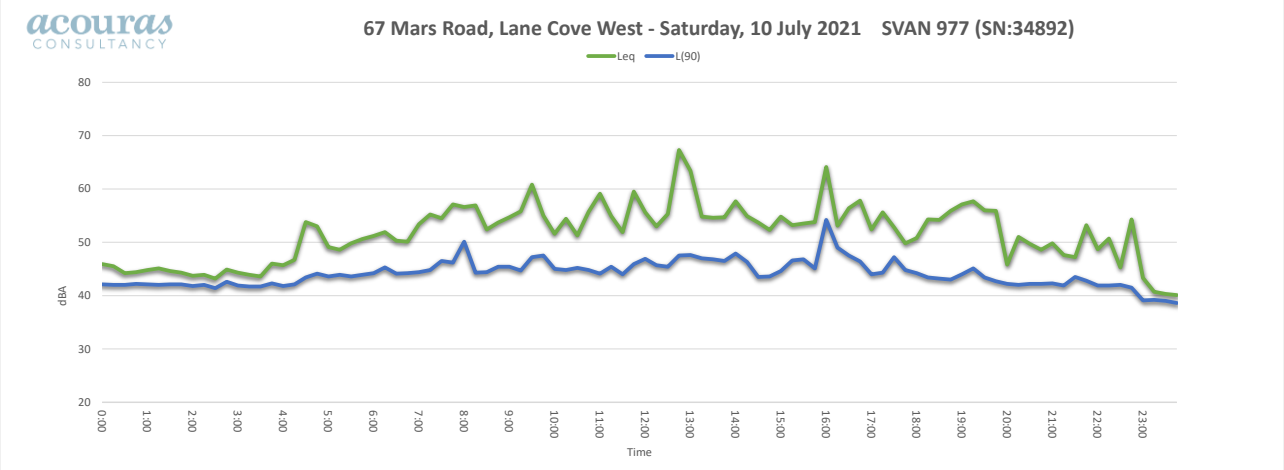
This assessment was based on the following architectural drawings provided by Architex.

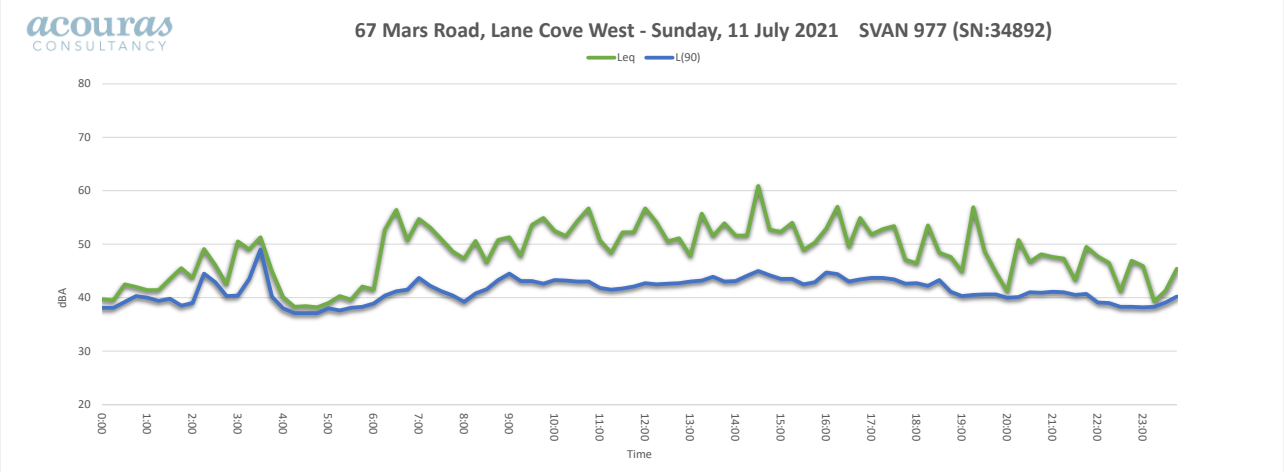
Drawing	Issue	Date	Description
01	C	06-08-2021	Site Analysis
02	D	09-09-2021	Site Plan
03	D	09-09-2021	Basement Level 03
04	D	09-09-2021	Basement Level 02
05	D	09-09-2021	Basement Level 01
06	D	09-09-2021	Level 01
07	C	06-08-2021	Level 02
08	C	06-08-2021	Roof Plan
09	C	06-08-2021	Site Elevations
10	C	06-08-2021	Site Elevations
11	C	06-08-2021	Site Sections

Appendix C – Noise Logger Results





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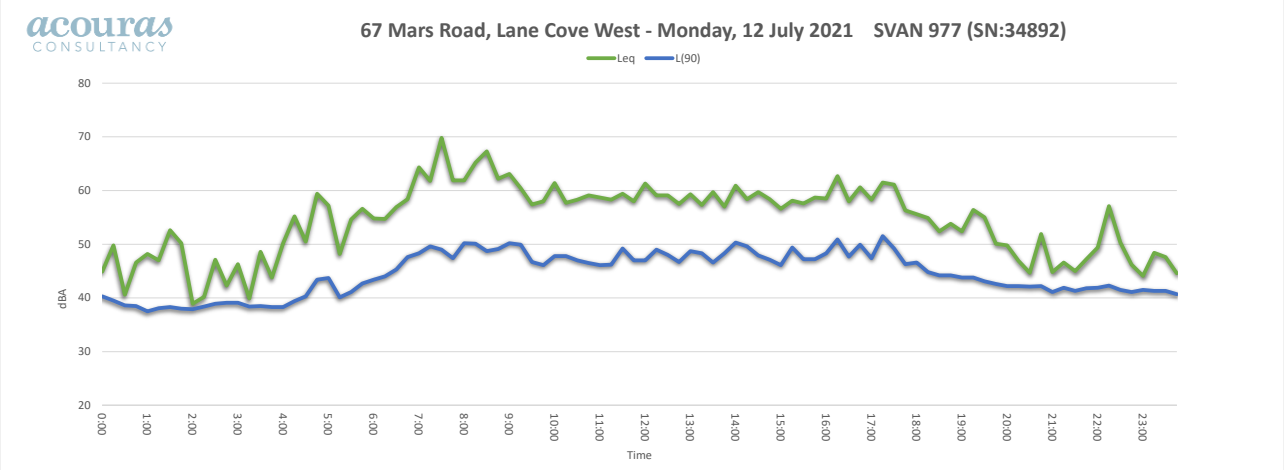
Leq
L(90)
dBA
Time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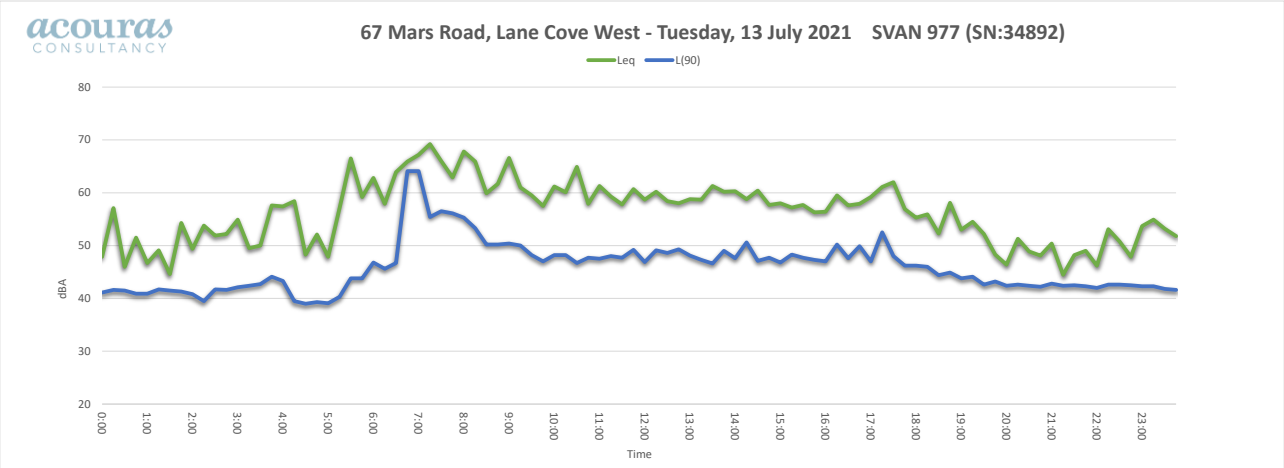
Leq
L(90)
dBA
Time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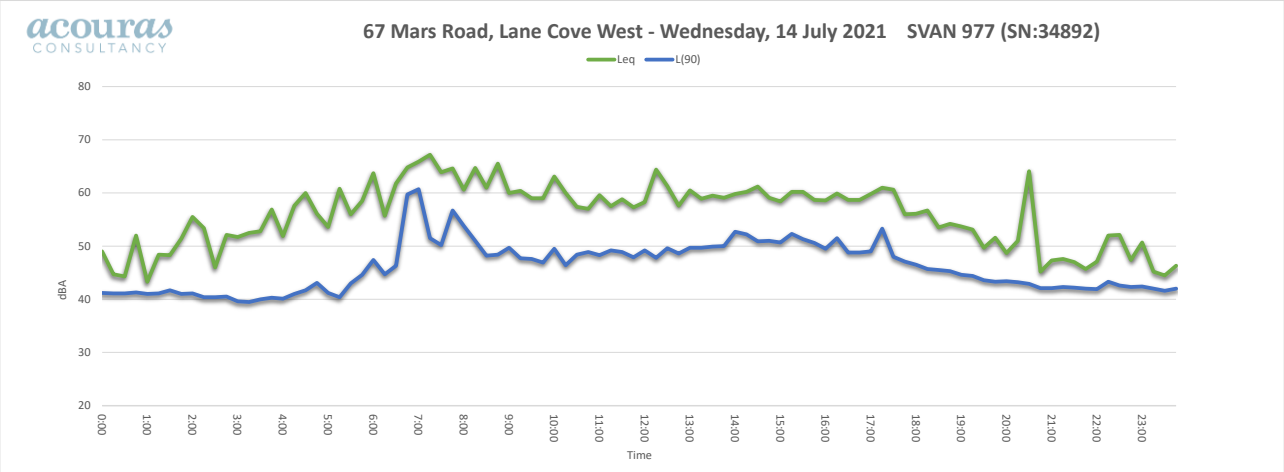
Leq
L(90)
dBA
Time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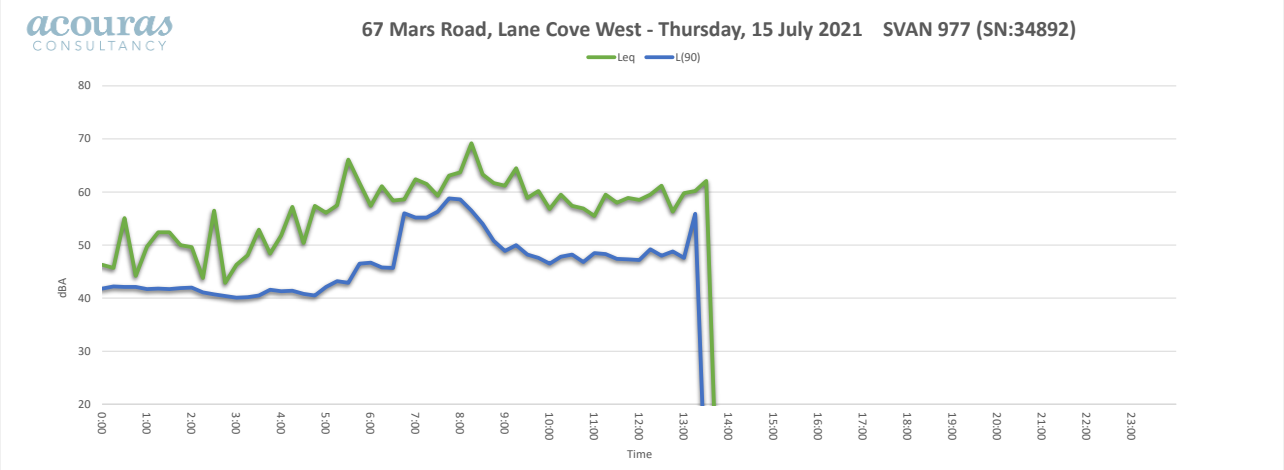
Leq
L(90)
dBA
Time


67 Mars Road, Lane Cove West - Thursday, 15 July 2021 SVAN 977 (SN:34892)
Leq
L(90)
dBA
Time