21 October 2018

Preliminary Noise Emissions Survey In Line With BS4142:2014

Dear Residents,

The following preliminary report covers the noise emissions from the open-air music system installed at the Catering Establishments; [redacted], situated at Qui-si-sana seafront, Sliema, Malta

Yours faithfully,

John Fenech

Chairman: NASoM

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NOISE EMISSIONS REPORT IN LINE WITH BS 4142:2014 & BS 8233:2014
Client & Address

1.0 CLIENTS.....

2.0 SCOPE OF REPORT

To study if the Noise Sensitive Receptors (NSRs) are directly affected by the music played from the open-air amplified sound system installed at the …….Catering Establishments and assess if complaints are justified by the Sensitive Receptors.

The noise emission sources and the NSRs as illustrated in site plan 1

The assessment is being carried out in full accordance with BSI standards, "*Method for rating noise affecting mixed residential areas*"

Noise Criteria:
BS8233:2014: It suggests that an internal noise level of *L*Aeq, *T* 30 dB within bedrooms is a 'good' standard, whilst *L*Aeq, *T* 35 dB is a 'reasonable' standard. For living areas in the daytime, the standard recommends *L*Aeq, *T* 30 dB as a 'good' standard and *L*Aeq, *T* 40 dB as being a 'reasonable' standard.

With regards to noise levels in external amenity areas, BS 8233:2014 states: "it is desirable that the steady state noise level does not exceed LAeq, T 50 dB and LAeq, T 55 dB should be regarded as the upper limit."

WHO document on the *Guidelines for Community Noise (London 1999)*
Annoyance: The capacity of a noise to induce annoyance depends upon its physical characteristics, including the sound pressure level, spectral characteristics and variations of these properties with time.
During daytime, few people are highly annoyed at LAeq levels below 55 dB (A), and few are moderately annoyed at LAeq levels below 50 dB (A). Sound levels during the evening and night should be 5–10 dB lower than during the day.

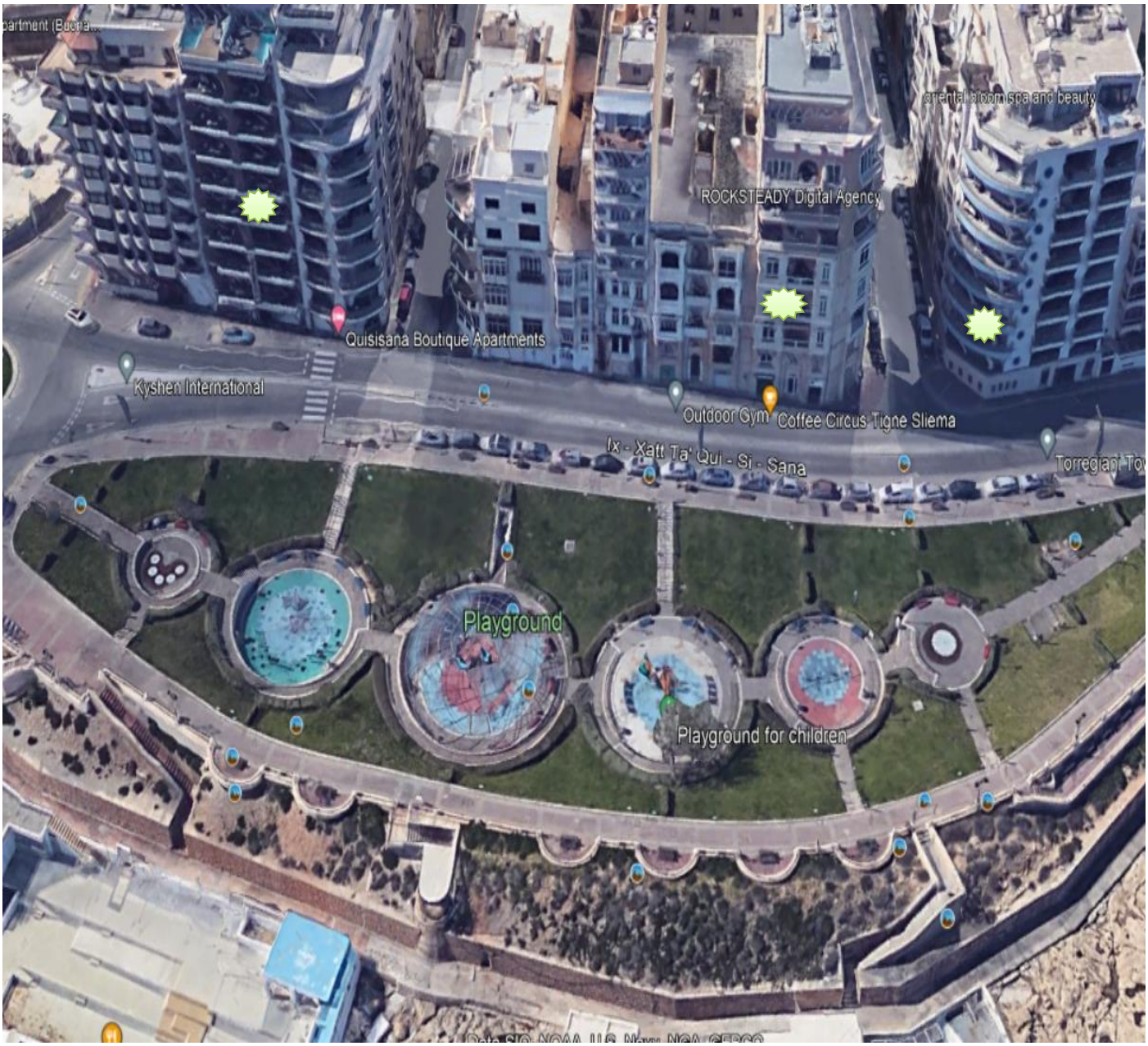
Why is the need for guidelines to assess and mitigate noise pollution?

WHO/EU
Current estimates suggest that many millions of people around the world are seriously affected by (environmental) noise in their communities. This noise is increasingly perceived as being related to the sustainability of growth because it has negative effects on the quality of life and well-being of people around the world and because of its potential for causing harmful physiological health effects. With increasingly urbanized societies it is inevitable that unless control of noise impact is adequately dealt with, this situation will only get worse.

3.0 GENERAL INFORMATION ABOUT THE SORCE AND THE NEIGHBOURHOOD

The Noise Sensitive Receptors are at a distance of approx. 80 meters and at an elevation of 21 meters from the Catering Establishments, …….which are located on Qui Si Sana shoreline

3.1 *Site Plan 1: Location of the* Catering Establishments & the NSRs



Noise Sensitive Receptors

4.0 GENERAL INFORMATION ABOUT THE BASIS OF THE REPORT

BS 4142:2014, "describes a method of determining the level of a noise of an industrial nature, together with procedures for assessing whether the noise in question is likely to give rise to complaints from persons living in the vicinity"

The principle upon which the standard assesses the likelihood that an industrial facility will cause nuisance to the adjacent residential zones is best described in the following paragraph: *"Response to noise is subjective and affected by many factors (acoustic and non-acoustic). In general, the likelihood of complaint in response to a noise depends on factors including the margin by which it exceeds the background noise level, its absolute level, time of day, change in the noise environment etc., as well as local attitudes to the premises and the nature of the neighbourhood".* BS 4142:2014 "*is only concerned with the rating of a noise of an industrial nature, based on the margin by which it exceeds the background noise level with an appropriate allowance for the acoustic features present in the noise. As this margin increases, so does the likelihood of complaint."*

BS 4142:2014 acknowledges that the "*likelihood that an individual will complain depends on individual attitudes and perceptions in addition to the noise levels and acoustic features present*", yet the standard itself "*makes no recommendations in respect of the extent to which individual attitudes and perceptions should be taken into account in any particular case."*

When used to rate the likelihood of complaints, the LA90 background noise level is subtracted from the specific noise. A difference of around +10 dB or higher indicates that complaints are likely; a difference of around +5 dB is of marginal significance; and a difference of -10 dB is a positive indication

5.0 DATES OF INSPECTION VISITS

*June 19th, 21st & 22nd, 23rd of the 2018
*July 27th of the 2018

The inspections were conducted at the NSR residence with the *presence or guidance of Mr. J. Fenech

Other monitoring was conducted on the following dates::

Noise source	$L_{Aeqt,\Delta T}$	L_{90}	L_{10}	Lmax	Date	Recording Location
Background	54.2	51.5	57.6	76.1	19-June	Locker Street Sliema
Background	54.2	51.7	57.6	76.9	09-July	Locker Street Sliema
Background	53.0	47.8	55.1	74.5	12-Jul	Terazzin Q1
Active	60.8	57.9	62.4	76.8	20-June	Terazzin East 1
Active	57.0	54.7	58.8	65.0	24-June	Locker Street Sliema
Active	62.4	59.4	64.5	74.4	10-July	Locker Street Sliema
Active	63.7	60.0	65.9	69.2	15-Jul	Locker Street Sliema
Active	61.6	59.6	63.1	71.5	20-Jul	Locker Street Sliema
Active	65.8	59.4	63.3	71.4	27-Jul	Apt 6
Active	65.8	63.5	67.6	71.2	27-Jul	Apt 6

6.0 PROCEDURE IN ACCORDANCE TO BS 4142:2014, SECTION 10

A Evening source under investigation	
1	Description of source and of specific noise a. Noise transmitted to the residences from the following sources: 1) Catering Establishments – …… b. The specific noise is from: 1) Sound Amplification System .
2	Hours of operation Early evening till early morning
3	Mode of operation A public address system used to project sounds from instruments, voices and other acoustic sources.
4	Description of premises in which source is situated Open- air space of the Catering Establishment

1	*Dominance or audibility of specific noise* *Amplified music from the Catering Establishments indicated in the location 1*
2	Main sources contributing to the residual noise Predominantly Traffic noise

1	*Location of measurement position* *The noise level was measured at the Residents Units shown in location 1* *The measurement at the NSLs location was conducted circa 1 metres from the residential unit's building façade*
2	Ground topography The Residential Units elevation is circa 20 metres above the level of the Catering Establishments The level difference tends to Accentuate the acoustic noise transmitted from the sources to the residences units.

1	*Type: Meets IEC651, Type 2 & 1 requirements*
2	Manufacturer: Casella Model CEL 246 and Cirrus CK 171 A
3	Serial Number: 60519271 and G080702
4	Details of the latest verification test: 1st Dec 2017 and 1st July 2018

E Operational Test	
1	Reference level of calibrator: CR:511E Acoustic Calibrator to IEC 942,
2	Meter reading before measurement with calibrator: 93.7 dB
3	Meter reading after measurement with calibrator: 93.7 dB

F Weather conditions (applicable to both test dates)	
1	Wind speed and direction Speed less than Force 2 (Beaufort scale), Wind direction: variable
2	Weather condition Calm, clear
3	Precipitation None
4	Fog None

G Date and time of measurements as in Appendices 1 to 4

1 Specific noise level

Receptor	*Evening*
Residential Units	21/06/2018 from 21:20 till 22:23
	23/06/2018 from 19:57 till 20:36
	27/7/2018 from 22:30 till 28/7 00:07:

2 Background noise levels

Receptor	*Daytime & Evening*
Residential Unit	19/06/2018 from19:43 till 20:46
	22/06/2018 from 15:43 & 16:50

H ***Specific noise level (sources)***

1 Measured noise level(s)

Refer to Appendices 1 and 2 for the noise character as measured on site.

Section 5 contains several tests carried out to determine the specific noise levels as measured for Residential Units

2 Residual noise levels and method of determination

The Back ground noise level is the continuous A-weighted sound pressure level of the residual noise i.e. the ambient noise remaining at a given position in a given situation when the specific noise source is suppressed to a degree that it does not contribute to the background noise. This was obtained by measuring the noise level at the residential units when the source was off. The characteristic trends can be viewed in Appendix 1 & 2

The residual noise levels were thence determined to be:

Condition	*Location*	*Residual Day / Evening level*
Day	Residential area	$L_{Aeq,64\ min}$ = 54.2 dB
Evening	Residential area	$L_{Aeq,67\ min}$ = 53.0 dB

3 Specific noise level and method of determination

The specific noise level is the continuous A-weighted sound pressure level at the assessment position over a given reference time interval that is produced by the noise source that is being investigated for assessing the likelihood of complaints. This was obtained by measuring the noise level at the residential units after the source [Amplified Music] was on. The characteristic trends can be viewed in Appendix 3, 4 & 5

The specific noise levels is summarised below :

Condition	*Location*	*Specific Noise level*
Evening	Residential Units	$L_{Aeq,66min}$ = 66.9 dB
Evening/night	Residential Units	$L_{Aeq,\ 60\ min}$ = 65.0 dB

4 Justification of methods
The specific noise levels were investigated for the minimum period required
The residual noise level was measured when the source (Amplified Music) was off. A major contributing source to the residual noise level was the continuous sound emitted by traffic.

5 Details of any corrections applied: None.

I Measurement time intervals

1 Measurement time interval for the specific noise levels:

Condition	*Location*	*Time Interval*
Evening	Residential Units	66 min
Evening/night	Residential Units	97min

2 Measurement time interval for the residual noise levels:

Condition	*Location*	*Time Interval*
Day	Residential Unit	64 minutes
Evening	Residential Unit	67 minutes

j	***Reference Time Intervals***
	The standard prescribes a reference time interval of 5 minutes for investigation of noises during the night (the definition of night being intended to refer to the times when the general adult population are preparing to sleep or are actually sleeping), and 1 hour for measurement of the specific noise level during the day. As such the reference time intervals used are in compliance with those required in the standard.

I	***Rating Levels***
1	Specific noise levels

Condition	*Location*	*Specific Noise level*
Evening	Residential units	$L_{Aeq,}$66min = 66.6 dB
Evening	Residential units	$L_{Aeq,}$ 66 min = 66.9 dB
Evening/Night	Residential units	$L_{Aeq,}$ 97 min = 65.8 dB

2	Acoustic features of the specific noise The noise generated from source is continuous with no distinguishable, discrete, continuous noises such as whines, hisses, screeches, hums etc., as such there is no need to apply an adjustment to the specific noise level in line with the directions of Clause 8 of the standard.
3	Rating levels

Condition	*Location*	*Rating levels*
Evening	Residential Units	$L_{Aeq,}$ 66 min = 66..9 dB
Evening/Night	Residential Units	$L_{Aeq,}$ 97 min = 65. 8 dB

K Background noise level

The background noise level is the A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90% of the given time interval.

For this study it was found to be as follows:

Condition	*Location*	*Background Noise level*
Day/ Evening	Residential Units	$L_{A\ 90\ ,64\ min}$ = 51.7 dB
Evening/Night	Residential Units	$L_{A\ 90\ ,67\ min}$ = 51.1 dB

M Assessment

1 Excess of the rating level over the measured background noise level

The difference between the rating level and the background noise level at each location is as follows:

Condition	*Location*	*Difference between rating level and background level*
Evening	Residential Units	+ 15.2 dB
Evening/Night	Residential Units	+ 14.7.dB

2 Assessment

The standard defines the likelihood of complaints by the excess of the rating level above the background noise level as follows:
- A difference of + 5dB is of marginal significance
- A difference of +10 dB or more indicates that complaints are likely.

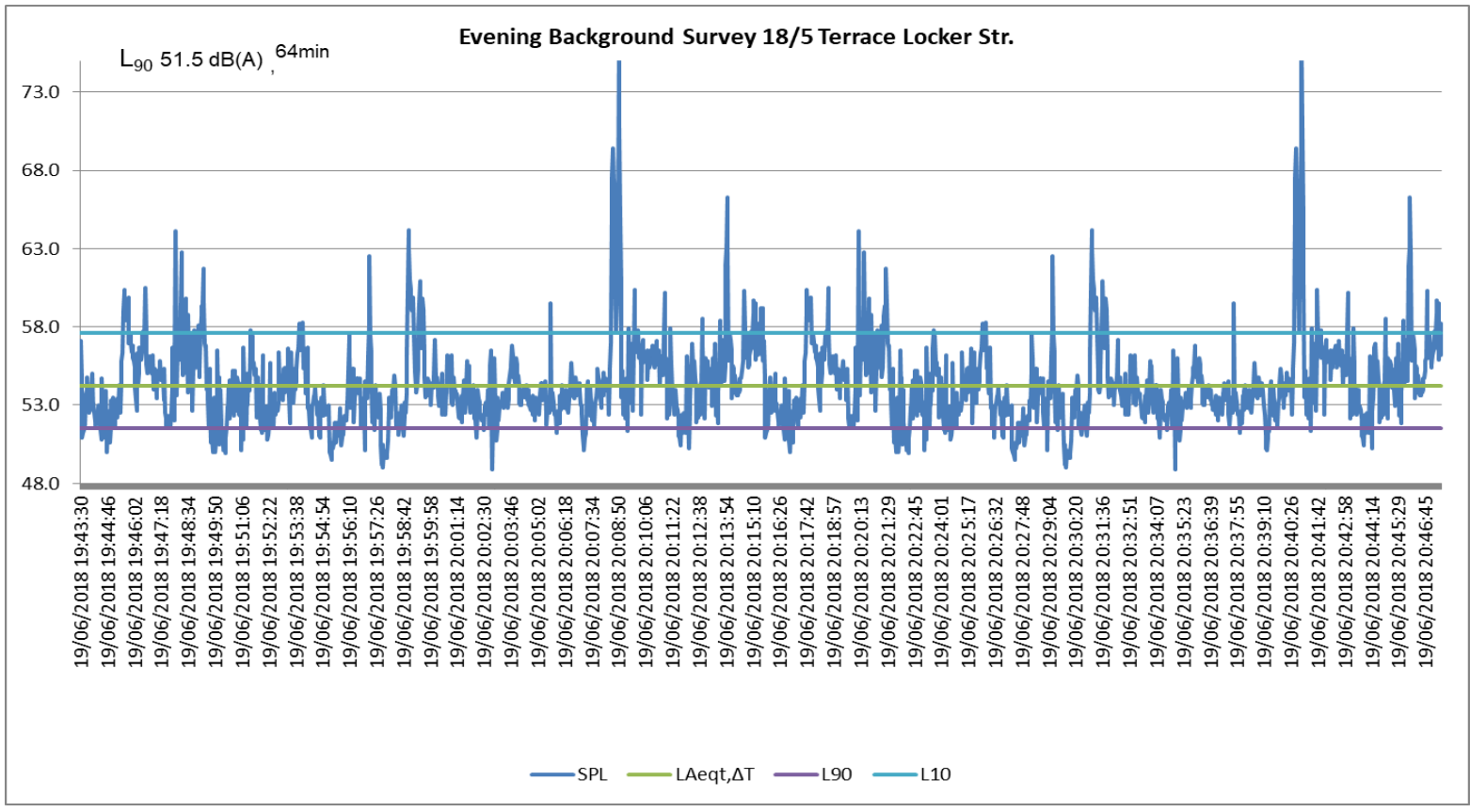
In this case the difference is 15 dB, indicating that complaints of noise annoyance are justified.

7.0 CONCLUSIONS

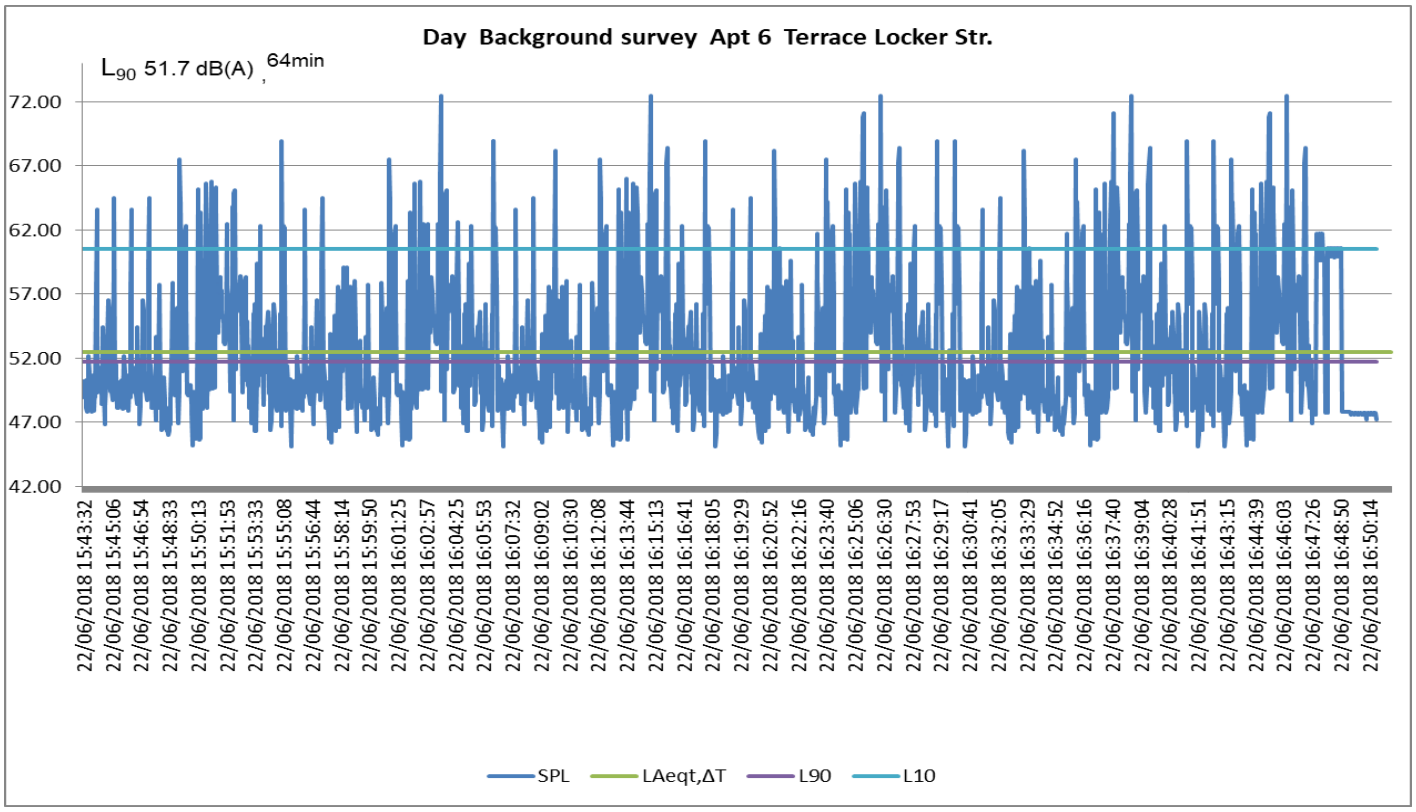
The methodology adopted in this report is based on BS 4142:2014 which assesses the likelihood for complaints solely on the difference between the rating level of the noise source and the background noise level, while ignoring other relevant factors such as its absolute value, the time of the day etc. as described in section 4 of this report.

Condition	*Location*	*Assessment*
Evening	Residential Units	+ 15.2 dB indicating that complaints of noise annoyance are justified
Evening/Night	Residential Units	+ 14.7 dB indicating that complaints of noise annoyance are justified

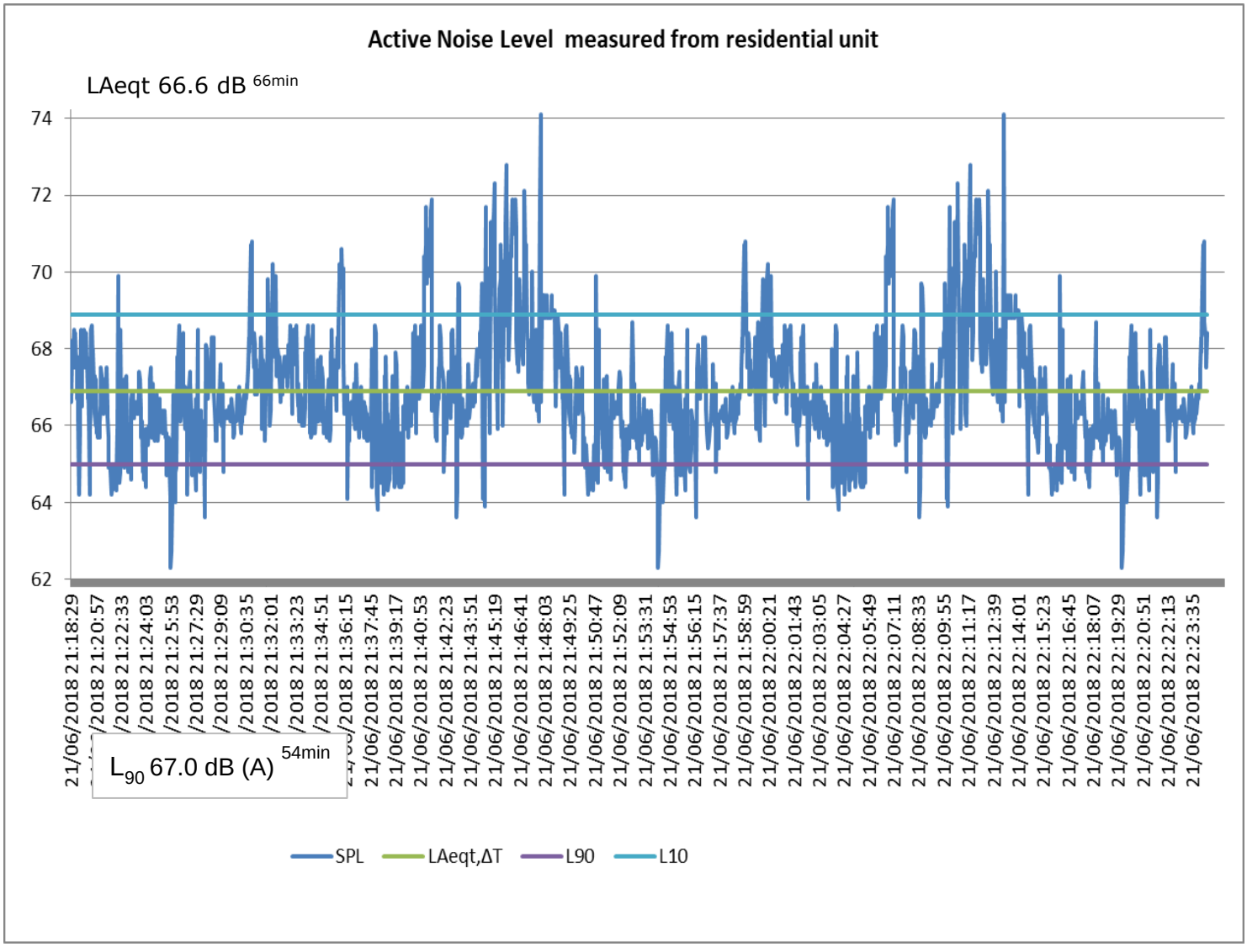
Annex 1



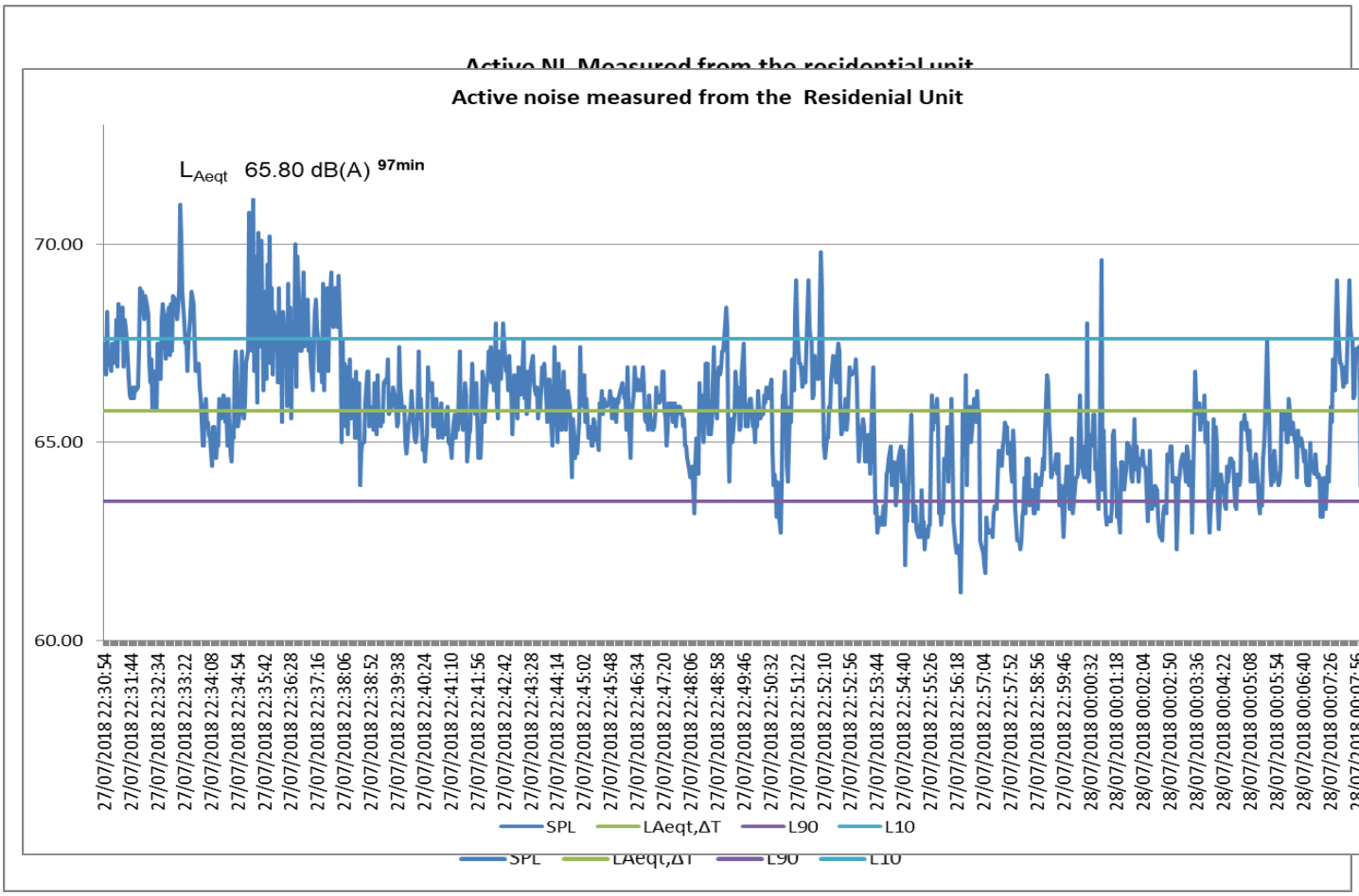
Annex 2



Annex 3



Annex 4



Annex 5