

ENVIRONMENTAL NOISE ASSESSMENT

On behalf of

Carlton Park Construction Ltd

For the site at:

Clock Walk, 7 High Street, Bognor Regis, PO21 1SG

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1. INTRODUCTION

1.1. General

Amber Acoustics has been commissioned by Carlton Park Construction Ltd to carry out an Environmental Noise assessment to accompany a planning condition discharge at Clock Walk, 7 High Street, Bognor Regis, PO21 1SG .

Planning was granted under decision notice BR/199/19/PL dated 6th December 2019 for the Conversion of an existing Health Centre (D1 non-residential institution) unit to 4 No. studio flats.

Under condition 3 of the approval, it stated:

“Prior to the occupation of the dwellings hereby approved, a scheme to demonstrate that the internal noise levels within the residential units will conform to the 'Indoor ambient noise levels for dwellings' guideline values specified within Table 4 under section 7.7.2 of BS 8233:2014. Details compiled by a competent, independent acoustician on sound insulation and noise reduction for buildings shall be submitted to and approved in writing by the Local Planning Authority. The scheme should take into account the correct number of air changes required for noise affected rooms. The works specified in the approved scheme shall be carried out in accordance with the approved details prior to occupation of these premises and retained thereafter.

Reason: To protect the amenity of local residents in accordance with Policy QE DM1 of the Arun Local Plan.”

1.2. Assessment Scope

This report will seek to demonstrate that, through adequate mitigation and proactive implementation of an upgrade to the external façade, the effect of external noise within the newly formed habitable rooms within the property will meet the acceptable standards of the Council, as well as the relevant British Standards.

Amber Acoustics have completed this report for the benefit of the individuals referred to in Section 1.1 and any other relevant statutory authority which may require reference in relation to approvals for the proposed development. Other third parties should not use, or rely upon, the contents of this report unless explicit written approval has been gained from Amber Acoustics.

Amber Acoustics accepts no responsibility or liability for the consequences of this documentation being used for any purpose or project other than that for which it was commissioned. It should also be noted herein that the issue of this document to any third party with whom approval for use has not been agreed.

2. SITE DESCRIPTION

The development site is the ground floor of Clock Walk, 7 High Street, Bognor Regis, PO21 1SG. The property is flanked by other commercial properties as well as a car park to the rear and a single width vehicle access road to the side.

3. ASSESSMENT STANDARDS

This section of the report outlines the context of the proposed development with respect to noise.

3.1. National Planning Policy Framework and Planning Practice Guidance

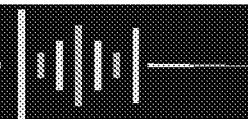
The NPPF, published in March 2012, sets out the Government's planning policies for England and how these are to be expected to be applied. The NPPF must be taken into account in the preparation of local and neighbourhood plans and is to be a material consideration in planning decisions.

Paragraph 123 of the NPPF advises that, with respect to noise emissions, planning policies and decisions should aim to:

- Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- Mitigate and reduce to a minimum, other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions

Planning Practice Guidance, published in March 2014, advises on how planning can manage potential noise impacts in new development. The guidance states that noise needs to be considered when *"...new developments would be sensitive to the prevailing acoustic environment."* Although noise can override other planning concerns, *"neither the NPSE1 nor the NPPF expects noise to be considered in isolation from the economic, social and other environmental dimensions of the proposed development."*

When making decisions, local planning authorities should take account of the acoustic environment and in doing so consider:



- Whether or not a significant adverse effect is likely to occur;
- Whether or not an adverse effect is occurring or likely to occur; and
- Whether or not a good standard of amenity can be achieved.

In line with the Explanatory Note of the NPSE this would include identifying whether the overall effect of the noise exposure would be above or below the significant observed adverse effect level. The guidance points to the Explanatory Note for Noise Policy Statement for England 2010 for further information.

3.2. Noise Policy Statement for England 2010

The NPSE sets out the long-term vision of Government noise policy. The Noise Policy Vision is supported by the following Noise Policy Aims:

- Avoid significant impacts on health and quality of life;
- Mitigate and minimise adverse effects on health and quality of life; and
- Where possible, contribute to the improvement of health and quality of life.

The NPSE categorises noise exposure through the concept of observed effect levels:

No Observed Effect Level (NOEL): The level below which no effect can be detected.

Lowest Observed Adverse Effect Level (LOAEL): the level above which adverse effects on health and quality of life can be detected.

Significant Observed Adverse Effect Level (SOAEL): the level of noise exposure above which significant adverse effects on health and quality of life occur.

The second Noise Policy Aim refers to the situation where the noise impact lies between the LOAEL and the SOAEL. It requires that, *"...all reasonable steps should be taken to mitigate and minimise effects on health and quality of life... This does not mean that such adverse effects cannot occur."*

The NPSE does not contain specific noise level limits to define the SOAEL as it is likely to be different for different noise sources and parameters. In the absence of national LOAEL and SOAEL noise level criteria, noise levels have been assessed against criteria contained within BS8233:2014 and WHO Guidelines.

3.3. The World Health Organisation Guidelines

The WHO Guidelines for Community Noise 1999 consolidate scientific knowledge on the health impacts of community noise and provide guidance to protect people from the harmful effects of noise in non-industrial environments.

Although this guidance was updated in 2018, the specific references to noise levels were omitted, and have still, to the best of the authors' knowledge, not been updated or clarified by the WHO. Therefore, the 1999 guidelines are referenced herein as they contain the specific noise level targets which tie in nicely with those listed in other British Standards.

The WHO Guidelines for Community Noise set out health-based guideline values for community noise, including recommended noise level values for the onset of sleep disturbance, annoyance and speech interference for the general population. Guideline values are provided for outdoor living areas, living rooms and bedrooms, for both continuous noise and discrete noise events. These are:

$LA_{eq,T}$ - the A-weighted equivalent continuous noise energy level over a given period of time T, applied to fluctuating noise levels to give single figure descriptor and sometimes referred to as the 'average'; and

LA_{Fmax} - the maximum A-weighted noise instantaneous sound pressure level recorded during a measurement period using a fast time response.

With regard to outdoor living areas, the WHO Guidelines for Community Noise state that, "... in order to protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55dB(A) LA_{eq} on balconies, terraces, and in outdoor living areas".

Table 1: WHO Guideline Values for Community Noise

Specific Environment	Critical Health Effect (s)	L_{Aeq} dB(A)	Time base (hours)	LA_{Fmax} fast dB(A)
Outdoor living area	Serious annoyance, daytime and evening.	55	16	-
	Moderate annoyance, daytime evening.	50	16	-
Dwelling indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	-
Inside bedroom	Sleep disturbance night-time	30	8	45
Outside bedroom	Sleep disturbance, window open (outdoor values)	45	8	60

Source: World Health Organisation 1999

3.4. BS8233:2014

BS8233:2014 contains suggested criteria for common situations, such as resting and sleeping, and proposes noise levels that normally satisfy those criteria for most people. For dwellings, the main considerations are:

- For bedrooms, the acoustic effect on sleep; and
- For other rooms, the acoustic effect on resting, listening and communicating.

Suggested noise levels reflect those contained within the WHO Guidelines. BS8233:2014 advises that the time period T, should be appropriate for the activity involved, in this case the daytime $L_{Aeq,16hr}$ (07:00-23:00) and night-time $L_{Aeq,8hr}$ (23:00-07:00).

Table 2 below details guideline values for dwellings as recommended within BS8233:2014.

Table 2: BS8233:2014 Recommended Noise Levels

Criterion	Typical situations	Time		
		Daytime 07:00 to 23:00 (LAeq)	Night-time 23:00 to 07:00 (LAeq)	Night-time 23:00 to 07:00 (LAMax)
Resting	Living room	35	-	
Sleeping (daytime resting)	Bedroom	35	30	45

Source: BS8233:2014

With regard to external noise levels in amenity spaces such as gardens, the guidance advises that "...it is desirable that the external noise level does not exceed 50dB $L_{Aeq,T}$, with an upper guideline value of 55dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited."

3.5. Assessment Methodology

The primary noise sources identified on-site were the road traffic and pedestrian noise along the footpath flanking the property especially by those utilising the car park behind the property.

As no commercial noise sources were noted in the vicinity of the site, the assessment will consider the resultant internal noise level due to road traffic noise, in accordance with BS8233:2014 – Guidance on sound insulation and noise reduction for buildings

4. SURVEY MEASUREMENTS

The Environmental Noise Assessment (referred to as MP1 in this report) took place over 3 days and 4 nights commencing at 23:00 on Friday 12th March 2022 and concluding at 07:00 on Tuesday 15th March 2022

The Noise survey was carried out generally in accordance with BS7445: 2003 'Description and Measurement of Environmental Noise'.

4.1. Measurement Locations

The Measurement location was as follows:

MP1 – A meter was positioned inside the ground floor flat which not only contained the highest amount of glazing but also flanked both sides of the property, and was therefore deemed to be the most acoustically receptive of the flats.

4.2. Meteorological Conditions

No excessive precipitation was noted during the survey, and the general wind speed in all directions was less than 5m/s, which is suitable for a noise survey. Detailed weather conditions are given in **Appendix C**.

4.3. Measurement Equipment

$L_{Aeq,T}$ and L_{AFmax} sound levels were recorded using a Type 1 Svantek SV307 Sound Analyser (serial number 87829). Measurements were A-weighted and recorded using a fast time response.

The sound level meter was calibrated using a Svantek SV36 Sound Calibrator (serial number 83149) at the start and finish of the monitoring period. No significant calibration drifts were observed. A detailed equipment list is given in **Appendix B** with calibration information in **Appendix D**.

4.4. Observations

The primary noise sources identified on-site were the road traffic and pedestrian usage of the footway and car park abutting the development site.

5. RESULTS

To assess the environmental noise climate, noise measurements were undertaken over a period 3 days and 4 nights over 12th – 15th March 2022. The results of the measurements are tabulated below. The worse performing scores are shaded in red and all mitigation will be based on those results.

Date	$L_{Aeq\ 16hr}$ (dB)	$L_{Aeq\ 8hr}$ (dB)	L_{Amax} (dB)
12/03/2022	-	27.9	45.4
13/03/2022	33.5	32.0	49.5
14/03/2022	30.8	28.0	46.4
15/03/2022	31.2	33.0	49.1

Table 1: Measurement Summary of Noise Survey 1 (MP1) Results.

6. ASSESSMENT

6.1. Existing Noise Climate

Sound levels in the vicinity of the site were mainly affected by the road traffic and pedestrian usage of the footway and car park abutting the development site.

6.2. BS8233: 2014 and WHO Guidelines Assessment

A summary of the relevant internal sound levels to be achieved at the proposed development is provided below:

Living rooms (daytime)	$L_{Aeq,T}$ 35dB(A);
Bedrooms(daytime)	$L_{Aeq,T}$ 35dB(A)
Bedrooms(night-time)	$L_{Aeq,T}$ 30dB(A); and
Bedrooms (night-time)	L_{AFmax} 45dB(A);

With regard to internal sound levels, from the site measurement data, it may be extrapolated that, in order to achieve BS8233: 2014 and WHO criteria, the building fabric of those façades will not need to be improved in regards to its performance during the daytime, and up to 3.0dB(A) during the night-time.

With regard to L_{AFmax} sound levels in bedrooms during the night-time, the building fabric of those façades with a direct line of sight to both roads will need to provide a minimum sound reduction of up to 4.5dB(A).

7. MITIGATION

It has been identified that the environmental noise climate on site is largely dominated by the road traffic and pedestrian usage of the footway and car park abutting the development site.

A façade specification (glazing and ventilation) has been identified, with the overall aim of reducing the incident external to internal noise ingress to within desirable criteria, as given in *BS8233:2014 – Guidance on sound insulation and noise reduction for buildings*.

As windows are typically the acoustically weakest point in a façade, requisite sound reduction to be provided by glazing and ventilation systems to achieve the guideline values has been considered.

The current glazing build up is of a standard 4/(6 to 16)/4 or similar build-up which is identified as having a R_w of 29.

The assessment indicates that a sound reduction of up to 4.5 dB sound reduction (R_w) will be required overall to meet the requirements of BS8233:2014.

Thermal double glazing, of the following specification (6/(6 to 16)/4/(6 to 16)/4) is generally capable of providing a typical sound reduction of approximately 34 Rw. (BS EN 12758:2019)

Background ventilation must be provided in accordance with the Building Regulations Approved Document F. In order to provide a sound reduction equivalent to that of the specified glazing, the $D_{n,e,w}$ value of the vent (when open) should be at least 7dB higher than the specified performance of the glazing.

To assist in identifying appropriate ventilators, a guide to the sound reduction performance delivered by example window mounted trickle ventilators is provided in the Table below.

Example Ventilator	Standard Vent	Titon TA5225 (V75) + TA5206 (C75) 2500EA
Sound Reduction ($D_{n,e,w}$)	23	44

8.0 Conclusion

Amber Acoustics was commissioned by Carlton Park Construction Ltd to carry out an Environmental Noise assessment to accompany a planning condition discharge at Clock Walk, 7 High Street, Bognor Regis, PO21 1SG .

The Environmental Noise Assessment has sought to establish existing daytime and night-time sound levels at the site, and then determine specific mitigation requirements based on the external and internal sound level criteria as set out within BS8233:2014 'Guidance on sound insulation and noise reduction for buildings' and World Health Organisation 'Guidelines for Community Noise'.

Noise survey results and assessment indicate that mitigation of local sound sources (roads) will be required in order to achieve the requisite internal sound level criteria in all areas of the proposed development.

The proposed mitigation strategy for the development comprises the installation of new thermal double glazing, with a typical minimum sound reduction of R_w 34 dB, and suitable acoustically attenuated passive ventilation.

It is considered that, with implementation of the specified mitigation strategy, sound levels will be attenuated to achieve recommended internal sound level criteria for new dwellings.

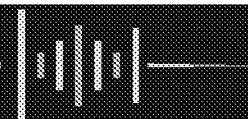
APPENDICES

APPENDIX A - Measurement Details					
Measurement	Kit	Start Date	Start Time	End Date	End Time
MP1	AA1	12 th March 2022	23:00	15 th March	07:00

APPENDIX B - Equipment Details					
Kit	Equipment	Make	Model	Class	Serial Number
AA12	Sound Meter	SvanteK	SV307	1	87829
AA2	Calibrator	SvanteK	SV36	1	83149

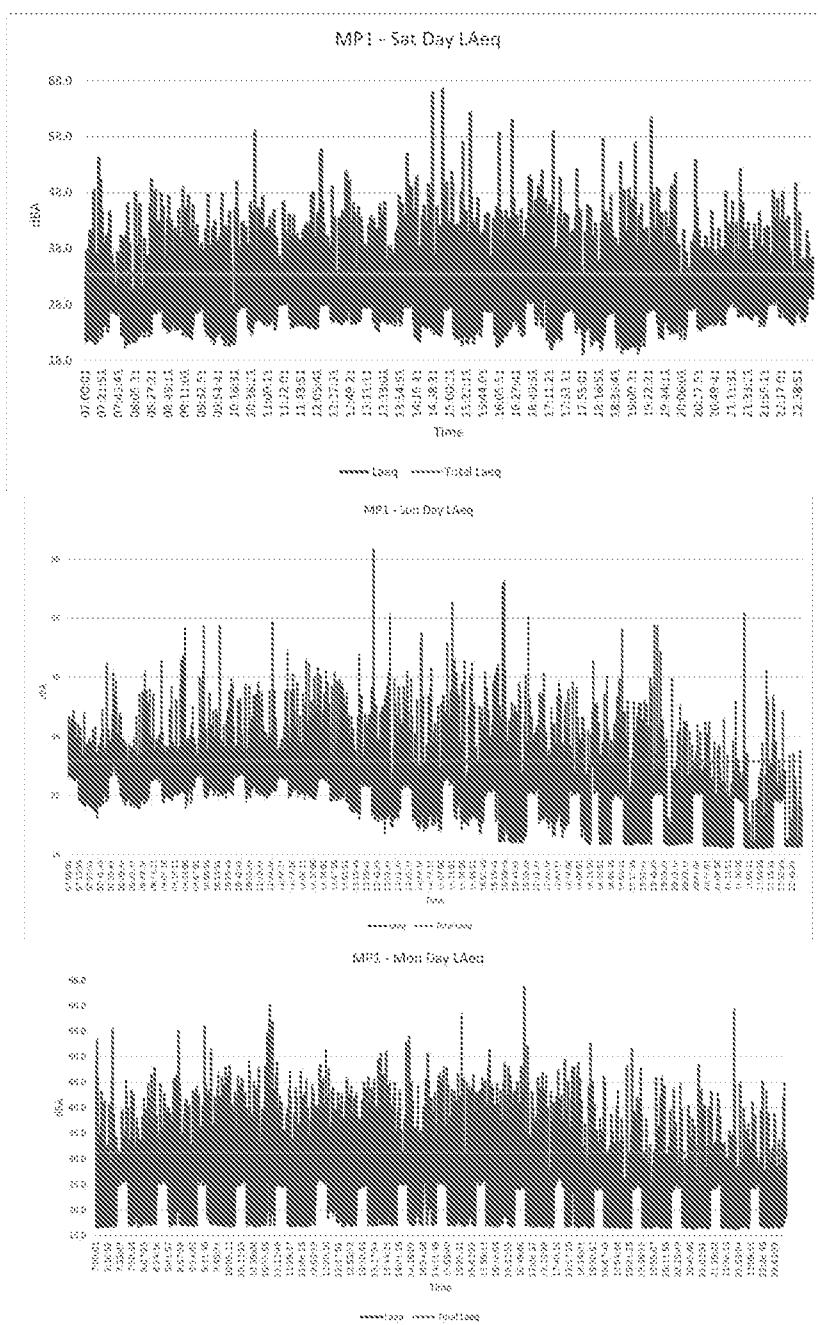
APPENDIX C - Meteorology Details			
Measurement	Temp C (Average)	Wind Speed m/s	Humidity %
MP1	16.3	1.2	63

APPENDIX D - Calibration Details					
Measurement	Calibrator Ref Level (dB)	Level Before (dB)	Deviation Before (dB)	Level After (dB)	Deviation After (dB)
MP1	114	114.2	-0.2	114.1	-0.1

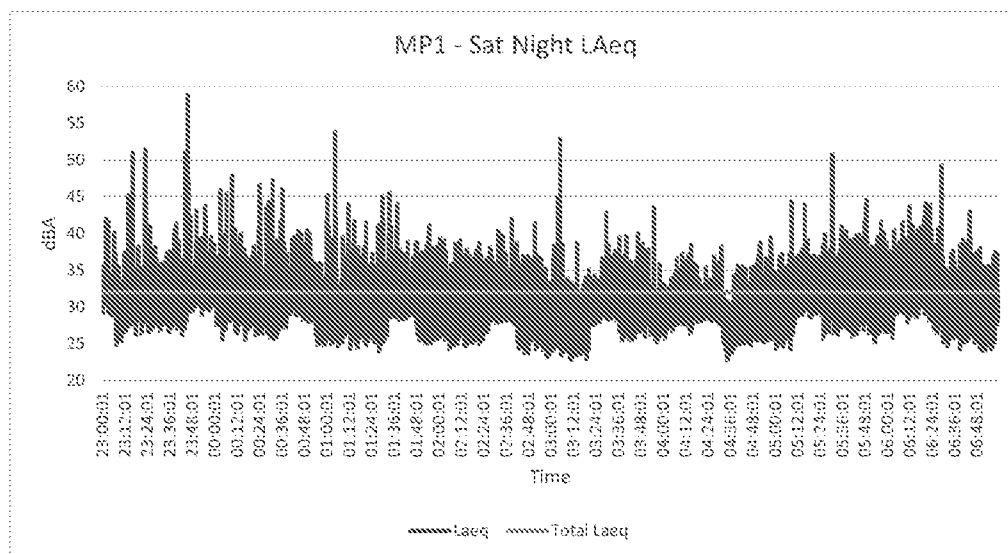
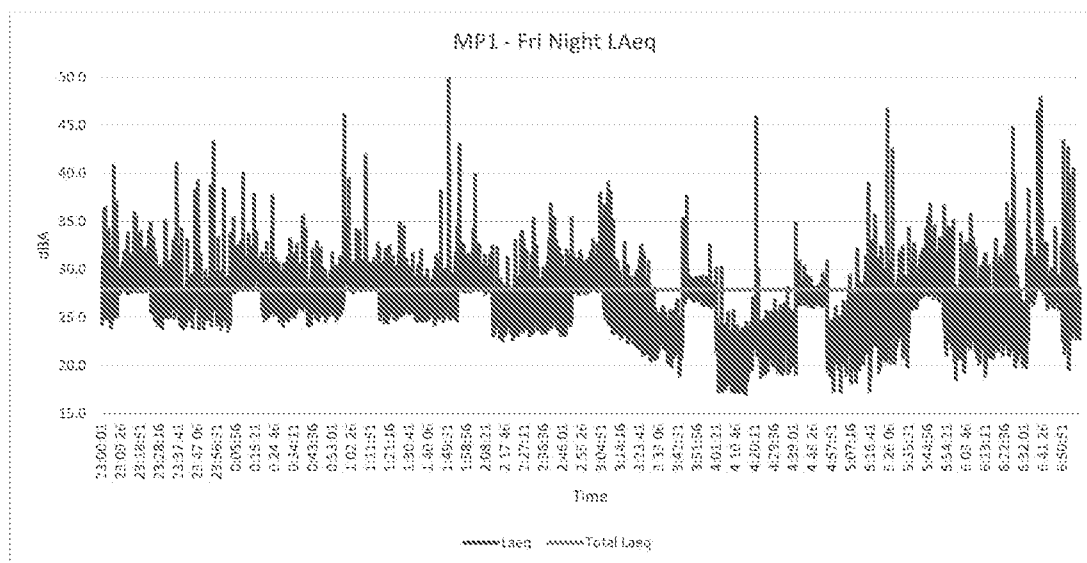


APPENDIX E – Survey Data

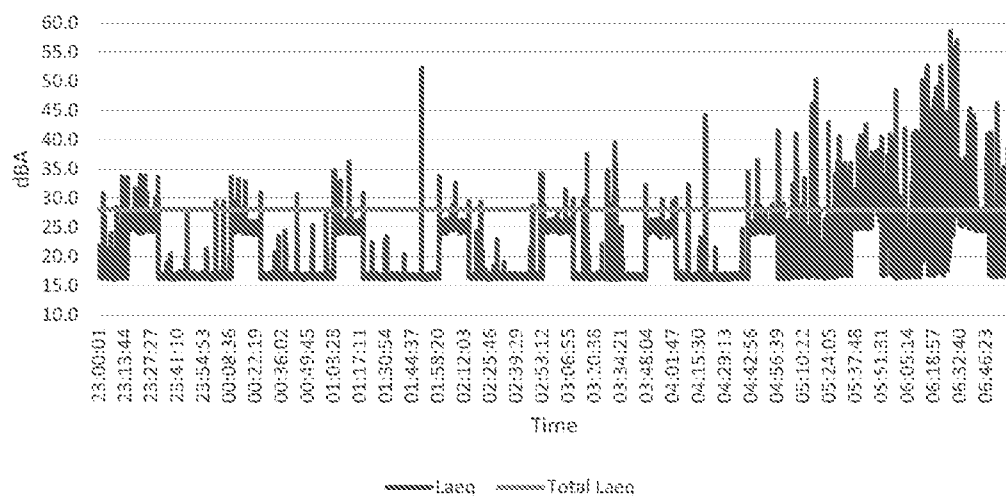
Daytime L_{Aeq} Noise Survey Data



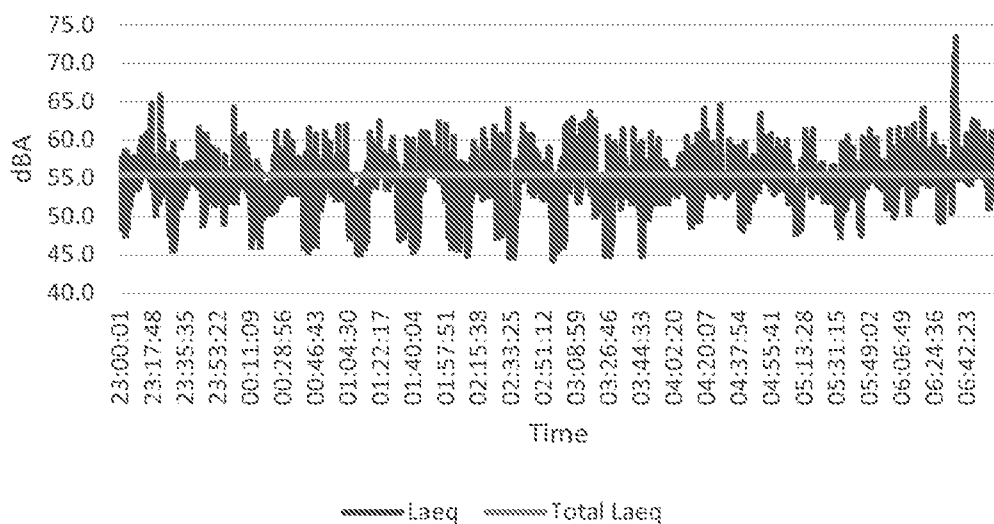
Night time L_{Aeq} Noise Survey Data



MP1 - Sun Night LAeq



MP1 - Mon Night LAeq



Night time L_{Max} (F) Noise Survey Data

