NOISE IMPACT ASSESSMENT

FOR

MERKUR CASINO

AT

CASHINO, CAMDEN HIGH STREET, LONDON

N-18856-1R0

JUNE 2021

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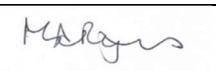
Signature			
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EXECUTIVE SUMMARY

Ensafe has been commissioned by Merkur Casino to undertake a Noise Impact Assessment for the proposed re-location of the Air Conditioning (AC) Plant from the roof of the existing Cashino, Camden High Street premises to the rear wall of the same premises.

Noise Survey

An environmental noise survey has been completed in order to quantify and assess the potential impact of noise due to the re-located plant upon existing residential dwellings.

The survey was conducted over a 24 hour period to ensure that the sensitive day and night time periods were captured, and the ambient and background noise levels established.

Noise Impact Assessment

A BS4142[1] assessment has been carried out to assess the noise impact on the nearest noise sensitive facades due to the re-located units. To aid the assessment manufacturer's data has been used to provide a specific noise level for the AC Plant. Taking into account the specific noise level of the AC Plant, the number of units running, reflections and shielding a rating level has been predicted for the nearest noise sensitive façade.

The results of the assessment consider that the re-location of the AC Plant from the current roof position to the rear wall of the Cashino building will have a positive benefit acoustically with no adverse impact expected. This also complies with the requirements of the Camden Council noise policies on mechanical plant and ventilation.

[1] BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound.

1.0 INTRODUCTION

1.1. Background

Ensafe have conducted a Noise Impact Assessment for Merkur Casinos. The assessment considers the impact of removing air conditioning plant from the roof of the Cashino premises in Camden to another part of the property, namely in a courtyard behind. The assessment has been prepared to support the planning application to re-locate these units.

This assessment has been undertaken to review and quantify the likely noise impact for the new location and has been done in line with the requirements of the London Borough of Camden Council (LBCC).

All acronyms used within this report are defined in the Glossary presented in Appendix II.

1.2. Site Location and Proposed Development

The Cashino premises are located at 107 Camden High Street, in the London Borough of Camden. Cashino is located in a row of premises consisting of varied retail, cafes, and restaurants. Located close by are number of residential buildings, particularly off Arlington Road to the west and May Terrace to the south. It is also assumed some residential properties are located above some of the existing retail properties in Camden High Street. Also in evidence, are varied forms of air conditioning and heating units located on adjacent roofs and walls. Behind the Cashino premises is a large building which previously was a live music venue (formerly The Forge), it's current use is unknown.

It is proposed to move the existing AC Plant (Fujitsu DC Inverter Units) from the roof of the premises and re-locate them to the courtyard behind on the rear façade of the same premises. There is also currently a Vent-Axia unit located in the centre of the roof of the premises, this will be removed completely, and the opening capped. The re-located units will be wall mounted.

The limitations of this report are presented in Appendix I.

This assessment has been undertaken with due regard to the latest drawing layout 20.401.10 supplied to Ensafe, dated 5th January 2021.

The Site Layout and Noise Measurment Position (NMP1) are shown in Appendix III.

1.3. Limitations

Further limitations of this report are presented in Appendix I.

1.4. Confidentially

Ensafe has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from Ensafe; a charge may be levied against such approval.

2.0 ASSESSMENT METHODOLOGY

2.1. Local National Planning Practice Guidance

Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. When preparing local or neighbourhood plans, or taking decisions about new development, there may also be opportunities to consider improvements to the acoustic environment.

Local planning authorities' plan-making and decision taking should take account of the acoustic environment and in doing so consider:

- Whether or not signification adverse effect is occurring or likely to occur
- Whether or not 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 Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase wherever applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.

The Observed Effect Levels are as follows:

- **Significant observed adverse effect level:**
  This is the level of noise exposure above which significant adverse effects on health and quality of life occur;

- **Lowest observed adverse effect level:**
  This is the level of noise exposure above which adverse effects on health and quality of life can be detected;

- **No observed effect level:**
  This is the level of noise exposure below which no effect at all on health or quality of life can be detected.

Table 1 summarises the noise exposure hierarchy, based on the likely average response.

Table 1: Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not Noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not Intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and Intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and Disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Effect	Avoid
Noticeable and Very Disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation.

These factors include:

- The source and absolute level of the noise together with the time of day it occurs. Some types and level of noise will cause a greater adverse effect at night than if they occurred during the day – this is because people tend to be more sensitive to noise at night as they are trying to sleep. The adverse effect can also be greater simply because there is less background noise at night;
- For non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise; and
- The spectral content of the noise and the general character of the noise. The local topology and topography should also be taken into account along with the existing and, where appropriate, the planned character of the area.

More specific factors to consider when relevant:

- Where applicable, the cumulative impacts of more than one source should be taken into account along with the extent to which the source of noise is intermittent and of limited duration;
- Consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations; and
- If external amenity spaces are an intrinsic part of the overall design, the acoustic environment of those spaces should be considered so that they can be enjoyed as intended.

2.2. BS4142:2014 'Methods for Rating and Assessing Industrial and Commercial Sound'

This standard describes methods for rating and assessing sound of an industrial or commercial nature which includes:

- Sound from industrial and manufacturing processes;
- Sound from fixed installations which comprise mechanical and electrical plant and equipment;
- Sound from the loading and unloading of goods and materials at industrial and / or commercial premises; and,
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from processes or premises, such as that from forklift trucks, or that from train or ship movements on or around an industrial or commercial Site.

The procedure detailed in the standard compares the measured or predicted noise level 'the specific noise level' from any of the above detailed noise sources with the background sound level at a residential dwelling. The measured background sound level at a receptor should be reliable and should not necessarily ascertain a lowest measured background sound level, but rather to quantify what is typical.'

The specific noise level also acknowledges the following reference time intervals depending upon whether the noise source operates during daytime or night-time periods:

- Daytime (07:00 – 23:00): 1 hr; and,
- Night-time (23:00 – 07:00): 15 minutes.

There are a number of 'penalties' which can be attributed to the specific sound level depending upon the 'acoustic features' of the sound level under investigation as follows. These penalties vary in their weighting depending upon the severity of the acoustic feature, as follows:

Tonality

- +2dB: where the tonality is just perceptible;
- +4dB: where the tonality is clearly perceptible; and,
- +6dB: where the tonality is highly perceptible.

Impulsivity

- +3dB: where the impulsivity is just perceptible;
- +6dB: where the impulsivity is clearly perceptible; and,

- +9dB: where the impulsivity is highly perceptible.

Intermittency

- +3dB: where the intermittency is readily distinctive against the acoustic environment.

In addition to the above acoustic features, there is a penalty for 'other sound characteristics' of +3dB where a sound exhibits characteristics that are neither tonal nor impulsive, though are readily distinctive against the acoustic environment.

BS4142 goes on to state that the rating level is equal to the specific sound level if there are no such features present or expected to be present.

Assessment of the rating level relative to the background noise level can yield the following commentary:

- Typically, the greater this difference (between the rating level and the background sound level), the greater the magnitude of impact;
- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context; and,
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.

With the above in mind, it is common that a Local Planning Authority will specify their own criteria for the rating level relative to the background sound level and, where this is the case, this criterion usually takes precedence over a simple comparison of the rating level against the background sound level.

2.3. Camden Council Noise Policy on Plant and other Noise Generating Equipment.

In accordance with Camden Borough Council's Local Area Requirements for Planning Applications (2018) any development which could potentially create noise disturbance requires an acoustic report. Under Section 4: Reports and Assessments the types of applications required list a number of examples where there is potential for noise, including plant, ventilation, air extraction or conditioning equipment and flues. This driven by Camden Local Plan (2017) Policies A1 and A4.

Further to this, Camden Council advise for noise, vibration and ventilation assessments, the following should be included:

- Existing background noise levels measured over a 24 hour period. This includes the cumulative noise of all existing units;
- Any proposed measures to reduce noise, fume emissions and vibration;
- The system manufacturers specification of the proposed equipment to be installed, altered, or replaced; and
- Details of the method used to compile the report and examples of the calculations and assumptions made.

In addition, the latest Camden Planning Guidance Amenity document, published January 2021, covers noise and vibration in great detail under Section 6. Section 6.29 states that *Plant, ventilation, air extraction or conditioning equipment and flues can cause disturbance to residential properties. The Council would there welcome the use of long-term maintenance agreements to ensure that equipment maintains acceptable noise levels over it's lifetime and the use of timers to limit any unnecessary operation of the equipment.*

It is understood that Camden Council require noise emissions to be -5 dB below the background noise level, and -10 dB below the background level if an acoustic feature correction is applied.

3.0 SURVEYS

3.1. Background and Ambient Sound Survey

The Noise Measurement Position (NMP 1) is shown on Figure 1 of Appendix III.

Ensafe has conducted a 24-hour Background and Ambient Sound Survey at the rear of the Cashino premises in Camden High Street.

- 13:00 on Monday 24th May to 15:00 on Tuesday 25th May 2021.

The following noise measurement position was chosen for the Background and Ambient Sound Survey:

- Noise Measurement Position 1 (NMP1): Located in the courtyard behind the Cashino premises in Camden High Street. The microphone of the sound level meter was located in free-field conditions at a height of approximately 1.8m.

A summary of the measured L_{Aeq} and L_{A90} background sound pressure levels is presented below.

Table 2: Summary of Measured Daytime Ambient Sound Levels

Daytime period	**Measured Sound Pressure Levels (dB)**
	Range : $L_{Aeq,1hr}$
Monday 24th May – 13:00 to 23:00 hrs	54.1 – 64.5
Tuesday 25th May – 07:00 to 15:00 hrs	49.1 – 60.4

Table 3: Summary of Measured Night-time Ambient Sound Levels

Night-time period	**Measured Sound Pressure Levels (dB)**
	Range: $L_{Aeq,15min}$
Monday 24th May – 23:00 to 00:00 hrs	48.4 – 53.7
Tuesday 25th May – 00:00 to 07:00 hrs	47.5 – 51.7

Table 4: Summary of Measured Daytime Background Sound Levels

Daytime period	**Measured Sound Pressure Levels (dB)**	
	Range : $L_{A90,1hr}$	**Median $L_{A90,1hr}$**
Monday 24th May – 13:00 to 23:00 hrs	52.0 – 54.4	53.5
Tuesday 25th May – 07:00 to 15:00 hrs	47.8 – 52.8	52.4

Table 5: Summary of Measured Night-time Background Sound Levels

Night-time period	Measured Sound Pressure Levels (dB)	
	Range: $L_{A90,15min}$	Median: $L_{A90,15min}$
Monday 24th May – 23:00 to 00:00 hrs	48.4 – 53.7	49.7
Tuesday 25th May – 00:00 to 07:00 hrs	46.9 – 47.7	47.2

3.2. Equipment

The weather Conditions during the Noise Surveys were conducive towards the measurement of environmental noise being fine and dry with wind speeds below 5.0m/s.

The Noise Survey was completed using the noise measurement equipment as per Table 6 below.

Table 6: Noise Measurement Equipment

Equipment Description	Manufacturer & Type No.	Serial No.	Calibration Due Date
Sound Level Meter	01dB-Solo	65947	8th October 2021
Pre-amplifier	GRAS 40CE	Internal	
Microphone	01dB-Metravib	16831	
Calibrator	01dB-Metravib CAL-21	34744600	20th October 2021

The sound level meter was field-calibrated on Site prior to and after noise measurements were taken. No significant drift was witnessed. Calibration certificates are available upon request.

4.0 NOISE IMPACT ASSESSMENT

4.1. Plant Noise Emission Limits

The Air Conditioning (AC) plant currently installed on the roof of Cashino is being re-located to the rear of the premises. The main advantage of moving the units is that the noise currently being generated on the roof by the AC Plant will have less of an impact on any residential premises that currently overlook the roof area.

Background noise measurements recorded over the 24 hour period in the courtyard behind the Cashino premises varied between 47 and 54 dB L_{A90} whilst ambient levels varied between 49 and 64 dB L_{Aeq}. The main noise sources were road traffic on the roads surrounding Cashino, various AC Plant units located on the roof of Cashino and adjacent properties.

Due to the number of sources being measured during the survey it was difficult to quantify the individual noise levels of the AC Plant proposed to be moved from the roof of Cashino to the new courtyard area. Therefore, manufacturer's data was researched to find the noise specification for the type of unit in use.

The unit type Fujitsu AC Unit Type AOYG54LETL has a specified noise level of 55 dB(A) at 1m. This noise level has been used to calculate the likely noise levels at the nearest noise sensitive facades. Assuming a worst case scenario of all four units operating simultaneously the overall free-field noise level would be approximately 61 dB(A). However, as these units are to be wall mounted and located in a courtyard surrounded by reflective surfaces an additional 6 dB has be added. In addition, in accordance with BS4142 a character feature correction of +3dB has been added due potential humming noise from the units. Therefore, it is calculated that the overall level within the courtyard could be up to 70 dB(A), worst case. These calculations are summarised as follows

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Table 7: Calculated Noise Level within Cashino Rear Courtyard

Noise Source	Specific Noise Source @1m	All Noise Sources On (4 off)	Reflections And Directivity	BS4142 Character Correction	Residual Noise* (based on measured average L_{Aeq} – Source off	Total Specific Noise in Courtyard
Fujitsu DC Inverter Unit	55 dB	+6 dB	+6 dB	+3 dB	50 dB $L_{Aeq, 1hr}$ 47 dB $L_{A90, 15 mins}$	70 dB(A)

*The total specific noise and the residual noise levels are greater than 10 dB so no further correction to the total specific noise level is required in accordance with BS4142.

The nearest residential receptor is potentially no more than 15 metres from the courtyard (rear façade of Camden High Street), and only has partial sight of view of the courtyard, whilst the AC Plant would not be visible. It is calculated that without any shielding the noise level at the nearest façade (with windows) would be 47 dB(A). With the shielding provided by the rear wall of the Cashino building a further reduction of at least 10 dB could be expected resulting in a noise level of 37 dB(A) at the rear façade of the nearest noise sensitive receptor. These assumptions are summarised as follows:

Table 8: Calculated Noise Level at Nearest Noise Sensitive Facade

Total Noise in Courtyard Due to AC Units (worst case)	Distance to Nearest Receptor	Attenuation due to distance (70 + 20 x log (1m/15m)	Calculated value outside nearest noise sensitive facade	Additional Attenuation due to shielding of rear wall of Cashino building	Noise Rating (as per BS4142)
70 dB(A)	15 metres	-23 dB	47 dB(A)	-10 dB	37 dB(A)

Based on the background noise measurements taken, a BS4142 assessment has been carried out to assess the noise impact for the re-located units.

Table 9: BS4142 Assessment

Time Period	Noise Rating at Nearest Noise Sensitive Façade (based on Table 8 calculations)	Median Background Level (L_{A90}) – Source off	Excess of Rating over Background Level
Day	37 dB $L_{Aeq, 1hr}$	48 dB $L_{A90, 1hr}$	-11 dB
Night	37 dB $L_{Aeq, 15 mins}$	47 dB $L_{A90, 15 mins}$	-10 dB
The BS4142 assessment concludes that there will be no adverse impact on the nearest receptors in the context of the existing noise environment.			

It is understood that the London Borough of Camden Council require noise emissions to be -5 dB below the background noise level, and -10 dB below the background level if an acoustic feature correction is applied.

This corresponds with the following advice:

"The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact."

This indicates that the Rating Level, from any single or combined plant items and operations, shall not exceed the existing background sound level, when measured or calculated at the façade of the closest existing and proposed residential receptors.

Therefore, it is considered that the re-location of the Fujitsu AC Plant from the current roof position to the rear wall of the Cashino building will have a positive benefit acoustically with no adverse impact expected. This also complies with the requirements of the London Borough of Camden Council noise policies on mechanical plant and ventilation.

It is also recommended that a scheme of regular maintenance is carried out to ensure the AC Plant remains in good condition and noise levels do not increase due to poor maintenance and general wear and tear.

5.0 CONCLUSION

Ensafe has been commissioned by Merkur Casino to undertake a Noise Impact Assessment for the proposed re-location of the AC Plant from the roof to the rear wall of the existing Cashino premises in Camden High Street. This report has been prepared to support the planning application for this development

A noise survey has been conducted across a 24 hour period to establish the ambient and background noise environment. Noise levels were largely affected by existing AC Plant located within the vicinity of the premises and localised road traffic noise.

A BS4142 assessment has been carried out to assess the impact on the nearest noise sensitive facades due to the re-located units. To aid the assessment manufacturer's data has been used to provide a specific noise level for the AC Plant. Taking into account the specific noise level of the AC Plant, the number of units running, reflections and shielding a rating level has been predicted for the nearest noise sensitive façade.

The assessment has considered that the re-located units will have an acoustic benefit being moved from the roof and no adverse impact is expected in line with BS4142:2014 methodology.

END OF REPORT

APPENDIX I - LIMITATIONS

LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between Ensafe and the Client as indicated in Section 1.2.

2. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.

3. Ensafe cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by Ensafe is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by Ensafe in this connection without their explicit written agreement there to by Ensafe.

4. Where a noise survey is required to inform the assessment, Ensafe will endeavour to ensure that all noise measurements taken are robust, representative and reliable in order to inform an accurate noise impact assessment. Where limitations or constraints exist which prevent a suitable noise survey being completed, Ensafe will take all reasonable steps to make the client fully aware of any such limitations or constraints with a view to achieving the best possible outcome for the client. Where additional sound surveys are required, over and above those specified in our scope of works, then Ensafe reserves the right to charge additional fees.

5. Where mitigation measures are specified in our report, it should be noted that these measures are relative to a specific sound source, both in terms of the measured sound pressure level and the character of the source. Where either the sound pressure level or the character of the sound varies following completion of the sound survey, Ensafe cannot be held responsible for any subsequent variations in the proposed mitigation performance.

APPENDIX II – GLOSSARY OF ACOUSTIC TERMINOLOGY

NOISE

Noise is defined as unwanted sound. Human ears are able to respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude, but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting mechanism is used. This reduces the importance of lower and higher frequencies, in a similar manner to the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality or impulsiveness may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source.

The most widely used weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurement, and the levels are denoted as dB(A) or LAeq, LA90 etc., according to the parameter being measured.

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions.

An indication of the range of sound levels commonly found in the environment is given in the following table.

Table A1: Typical Sound Pressure Levels

Sound Pressure Level	Location/Example
0	Threshold of hearing
20 - 30	Quiet bedroom at night
30 - 40	Living room during the day
40 - 50	Typical office
50 - 60	Inside a car
60 - 70	Typical high street
70 - 90	Inside factory
100 - 110	Burglar alarm at 1m away
110 - 130	Jet aircraft on take off
140	Threshold of pain

ACOUSTIC TERMINOLOGY

Table A2: Terminology

Descriptor	Explanation
dB (decibel)	The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (2x10-5Pa).
dB(A)	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
$L_{Aeq, T}$	L_{Aeq} is defined as the notional steady sound level which, over a stated period of time (T), would contain the same amount of acoustical energy as the A - weighted fluctuating sound measured over that period.
L_{Amax}	L_{Amax} is the maximum A - weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L_{10} & L_{90}	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The Ln indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L_{10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the 'average minimum level' and is often used to describe the background noise. It is common practice to use the L_{10} index to describe traffic noise.
Free-field Level	A sound field determined at a point away from reflective surfaces other than the ground with no significant contributions due to sound from other reflective surfaces. Generally, this is measured outside and away from buildings.
Fast	A time weighting used in the root mean square section of a sound level meter with a 125millisecond time constant.
Slow	A time weighting used in the root mean square section of a sound level meter with a 1000millisecond time constant.

Figure 1: Noise Measurement Location