

Traffic Noise Measurement Requirements

For

Acoustic Consultants



September 2011

Acknowledgements

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1 INTRODUCTION

To ensure that all measurements are of high quality and are consistent over time, the following requirements have been developed and shall be observed by acoustic consultants whether engaged directly by VicRoads, or some other party engaged by VicRoads.

2 INSTRUMENTATION

Sound level meters, tape recorders and data loggers shall comply with paras 5.1.2 to 5.1.5 of *AS 2702 - 1984: Acoustics- Methods for the Measurement of Road Traffic Noise*.

Field checks of instruments shall be carried out with a piston phone, portable calibrator or other portable checking device prior to and on completion of the measurements. Full system calibration shall be carried out at intervals of not more than two years.

3 CERTIFICATION

A person holding a degree or diploma in electrical or mechanical engineering, a degree or diploma in science with a major in physics or such other qualifications and experience as approved by the Superintendent, shall be responsible for:

- overseeing the calibration of the instruments.
- supervising the instrument operator.
- certifying that the results presented are a true record and all relevant paragraphs of these guidelines have been complied with.

Instrument operators shall be adequately trained and then supervised by the person responsible for certification.

4 MICROPHONE POSITION

The microphone shall be substantially unobstructed (approx 135°) and shall be located externally, one metre from the centre of the most exposed window of a habitable room on the lowest habitable level of the building under consideration. Where the prescribed position is inaccessible for some reason, a site which is considered to be equivalent shall be used, but subject to approval by the Superintendent. A note of this shall be included in the final report.

Where free-field measurements are to be taken, the microphone shall be located approximately 1.2 metres above ground level. The desirable area free of vertical reflecting surfaces shall be a circle of 5.0 metres radius centred on the microphone.

5 MEASURING LOCATIONS

All locations where noise is to be measured are subject to the approval of the superintendent. At the construction and post-construction phases of a project, these locations will generally be where noise levels have previously been measured or calculated. Direct comparisons can then be made of the acoustic environment in the before and after situation. However, the superintendent, may approve alternate or additional locations.

It is essential that a clear photographic record of each microphone position, with respect to the exposed facade, will be presented in the report. A map of the measurement location with respect to the noise source, (eg a Melways Map) will be included in the report. The latitude and longitude of the microphone position is also required, in decimal format using the WGS84 datum. These can be determined by GPS or by locating the site with Google Earth.

6 MEASURING PERIODS

Noise measurements must be conducted on weekdays other than public holidays, school holidays, and the last day of any school term. This requirement is to ensure that typical workday traffic patterns are observed.

At least three days' valid measurements are required where the purpose of the test is the determination of pre-existing noise levels prior to the commencement of a project, or acceptance testing after the completion of a project.

It is strongly recommended that noise measurement is carried out for at least five days. This will increase the likelihood of achieving three days' valid data after any measurements affected by adverse weather conditions or other reasons are discarded.

7 WEATHER CONDITIONS

The ideal weather conditions for measuring traffic noise is fine with little or no wind. However, these conditions are not always available and so the instrument operator shall ensure that environmental conditions that may significantly affect the noise levels are controlled within appropriate limits.

The Consultant must report the weather conditions through out the measurement period. As a minimum, the morning and afternoon wind speed and direction as well as rain events must be reported. The location of the weather station must also be reported.

Wind: The effect of wind noise on the microphone shall be at least 10dB(A) below the received noise levels. To ensure the above condition applies, appropriate windshields shall be fitted to the microphone for the duration of the measurement period.

The wind speed at the microphone in any direction shall not exceed 3 m/s for any significant period/s during the conduct of the measurements.

Rain: Occasional light showers during the measuring periods are acceptable. However, when there are periods of heavy rain or continuous light rain measuring shall be abandoned.

Note: It may be requested that wind speed and direction be checked with a hand held anemometer at the beginning and end of each measurement period. However the Consultant should be aware of the weather patterns in the intervening periods and be prepared to report those conditions if requested to do so.

8 INFORMATION TO BE RECORDED

The hourly L_{10} dB(A) and L_{eq} dB(A) levels over the continuous measurement period

VicRoads may request that the Consultant measure hourly L_{max} dB(A) and L_{90} dB(A) for specific projects.

9 INFORMATION TO BE PRESENTED

- (a) Hourly L_{10} and L_{eq} levels in dB(A)
- (b) Hourly L_{max} dB(A) and L_{90} dB(A) when requested
- (c) The $L_{10 (18hr)}$, (arithmetic average) 6.00 am to midnight in dB(A), for a single day,
- (d) The $L_{eq (15hr)}$, (logarithmic average) 7.00 am to 10.00 pm in dB(A), for a single day,
- (e) The $L_{eq (16hr)}$, (logarithmic average) 6.00 am to 10.00 pm in dB(A), for a single day,
- (f) The $L_{eq (9hr)}$, 10.00 pm to 7.00 am in dB(A) for a continuous period.
- (g) The $L_{eq (8hr)}$, 10.00 pm to 6.00 am in dB(A) for a continuous period.
- (h) The latitude and longitude of the microphone position to six decimal places.

Items (a) to (h) are to be provided in a Microsoft Excel format. A template for the presentation of this data is available from VicRoads.

10 ADJUSTED AND REJECTED MEASUREMENTS

Where noise levels change as a result of an extraneous uncontrolled source, then measurements for the whole day shall be rejected if the extraneous noise lasts for more than 3 hours.

Where the extraneous source lasts for 3 hours or less, then the affected hourly measurements are to be rejected and derived descriptors presented. These shall be referred to, for example as $L_{10 (18hr)}$ adj or $L_{eq (15hr)}$ adj. Reasons for rejection of any measurements shall be given.

11 REVISION NOTES

| Date | Revision |
|------------|---|
| 23/11/2005 | Guidelines issued |
| 3/12/2009 | Allowance for wind speed up to 10 m/s deleted |
| 14/12/2010 | Latitude, Longitude, and summary sheet requirement added |
| 26/9/2011 | Measurement periods updated, prohibition of weekend measurement removed, treatment of adjusted and rejected measurements changed. |

