AS 3671—1989

Australian Standard®

Acoustics—Road traffic noise intrusion—Building siting and construction

This Australian Standard was prepared by Committee AV/5, Acoustics—Community Noise. It was approved on behalf of the Council of Standards Australia on 16 December 1988 and published on 10 April 1989.

The following interests are represented on Committee AV/5:

Association of Consulting Engineers, Australia

Australian Acoustical Society

Australian Environmental Council

Australian Institute of Health Surveyors

Australian Institute of Petroleum

Australian and New Zealand Pulp Industry Technical Association

Australian Road Research Board

Bureau of Steel Manufacturers of Australia

Department of Defence

Department of Occupational Health, Safety and Welfare, W.A.

Department of Transport and Communication

Institute of Marine Engineers

National Acoustic Laboratories

National Association of Australian State Road Authorities

National Building Technology Centre

Royal Australian Institute of Architects

Royal Australian Planning Institute

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PREFACE

This Standard was prepared by Standards Australia's Committee on Acoustics—Community Noise. It provides guidance to regional and local authorities, organizations, architects, and others associated with urban and regional planning and building production on the location and construction of new buildings in the areas near freeways, tollways, major roads, and national routes, and other roads carrying more than 2000 vehicles per day. It also provides guidance regarding the acoustical adequacy of existing buildings in areas near new or upgraded freeways, tollways, major roads, and national routes, and other roads carrying more than 2000 vehicles per day.

It is one of a series of Standards providing guidance for building siting and construction against noise intrusion from transportation sources. Other Standards in the series are AS 2021, *Acoustics—Aircraft noise intrusion—Building siting and construction*, and AS XXXX, *Acoustics—Railway noise intrusion—Building siting and construction**.

The extent of road traffic noise intrusion within a building depends substantially on the following factors:

(a) The levels of noise produced by traffic on nearby roads. These levels may be measured at appropriate locations or predicted from knowledge of traffic flow rates and vehicle mix, see Section 2.

(b) The location, orientation, and topography of the site relative to the direction of the road(s). For large sites, e.g. for schools, hospitals, or major residential or commercial developments, there may be significant differences in traffic noise levels at different locations, particularly after the planned development has taken place. In addition, significant topographical features may afford either shielding from or greater exposure to traffic noise. Purpose-built acoustic barriers may also be provided. Since such factors are site-specific they are not covered in detail in this Standard although they should be taken into account.

(c) The type(s) of activity to be or being accommodated in and out of buildings. Recommended acceptable sound levels vary according to the type of activity. AS 2107, *Recommended design sound levels and reverberation times for building interiors*, includes a comprehensive list of such levels. A selection of these has been used to determine recommended construction categories for certain building types exposed to different traffic noise levels (see Appendix A).

(d) The type(s) of layout, construction, and ventilation utilized. The layout of a building may in some cases be used to mitigate traffic noise intrusion, e.g. by placing kitchens, bathrooms, etc between noise-sensitive rooms such as bedrooms and the road. Since the planning of a building also depends on many additional factors and is unique to each case, this is not covered in this Standard. However, guidelines for the selection of suitable building elements for construction are included, (see Section 3). The predicted traffic noise reduction will be achieved only if windows, doors, and other openings are closed (in the relevant facades), thus alternative methods of providing ventilation must be provided for the rooms affected.

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* In course of preparation.

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SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This Standard concerns the reduction of road traffic noise intrusion in buildings in areas near new or upgraded freeways, tollways, major roads, and national routes or other roads carrying more than 2000 vehicles per day; it may also be used to assess the acoustical adequacy of existing buildings in similar areas. It provides guidelines for determining the type of building construction necessary to achieve acceptable noise levels indoors, as recommended in AS 2107, for different types of activity.

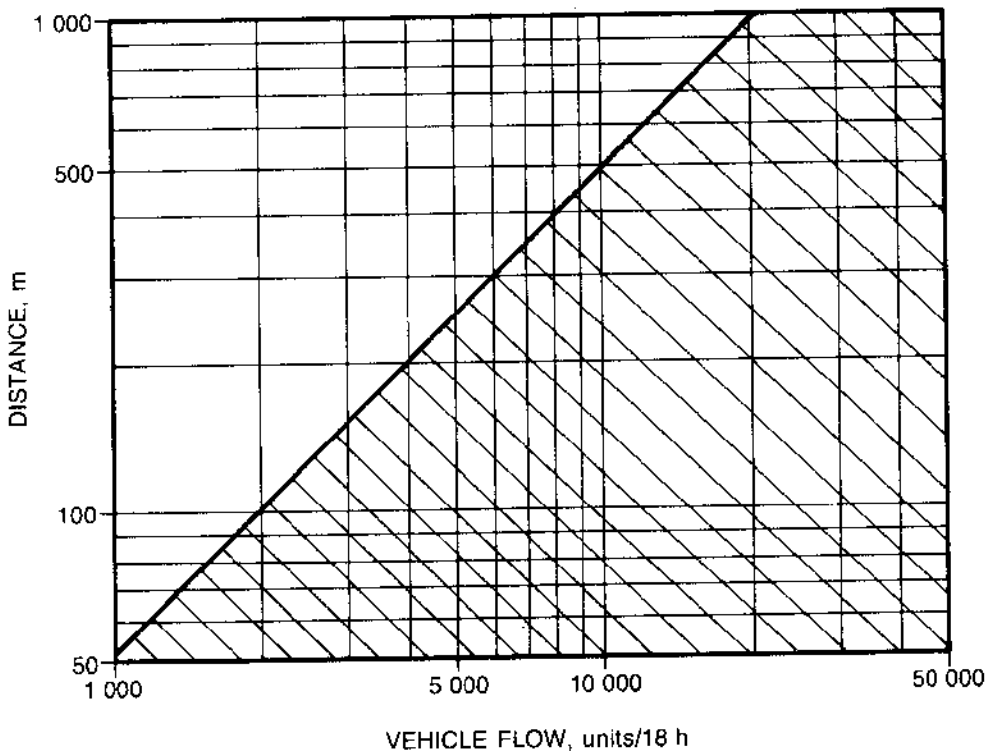
NOTES:

1. In cases where the required sound transmission losses of building components as calculated according to this Standard exceed those given in Appendix B, a special type of construction and design may be necessary to obtain an acceptable acoustic environment inside the building. Such buildings fall outside the scope of this Standard and specialist acoustic advice should always be obtained.
2. An example of the application of this Standard is given in Appendix D.

1.2 APPLICATION. Application of this Standard should be considered when a building site is located within certain distances from a road or roads depending on the traffic flow (see Figure 1.1). However, these distances should be used only as guidelines to indicate that the recommendations contained in this Standard should apply. Consideration should also be given to future development and the time scale concerned.

NOTES:

1. The distances shown in Figure 1.1 are based on an indoor level $L_{A10(18\ hour)}$ of 45 dB(A) in a building with natural ventilation. In most cases $L_{A10,T}$ is approximately equal to 3 dB above the $L_{Aeq,T}$.
2. In special circumstances the noise produced by the traffic may be found to be high even if the daily traffic flow is low. Such cases could arise where a road or roads have unusual traffic conditions (e.g. heavy vehicles to and from a quarry, or particularly bad road conditions). Steep gradients or elevated roads should be considered as special cases.
3. Traffic flow information may be obtainable from local and state government authorities.
4. This graph is valid only for line-of-sight propagation from the road to the building site. In some situations, building sites that are not in the direct line of sight or that are at greater distances than those shown may also be adversely affected by traffic noise.



NOTES:

1. Application of Standard should be considered within approximate distances on or below distance/flow line. (See shaded area of graph).
2. Graph is a guide only and is based on UK DoE (1975) algorithms.

FIGURE 1.1 APPROXIMATE DISTANCES OF BUILDING FROM TRAFFIC FLOW WITHIN WHICH APPLICATION OF THIS STANDARD SHOULD BE CONSIDERED