



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 50118-2010

Replacing GBJ 118-1988

Code for design of sound insulation of civil buildings

Issued on: August 18, 2010

Implemented on: June 1, 2011

**Issued by: Ministry of Housing and Urban-Rural Development of the
People's Republic of China;
General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China**

Table of Contents

- 1 General
- 2 Terms and symbols
 - 2.1 Terminology
 - 2.2 Symbols
- 3 General Plane Anti-noise Design

1 General

1.0.1 This specification is formulated in order to reduce the impact of noise on civil buildings and ensure a good indoor acoustic environment for civil buildings.

1.0.2 This code is applicable to the sound insulation, sound absorption and noise reduction design of the main buildings in six types of buildings, including newly built, rebuilt and expanded houses, schools, hospitals, hotels, office buildings and commercial buildings in cities and towns across the country. The rooms in other types of buildings can adopt the corresponding provisions of this code according to their use functions.

1.0.3 The allowable indoor noise level in this specification shall use A sound level as the evaluation quantity. The indoor allowable noise level in this specification shall be the standard value during daytime and nighttime with the windows closed. For rooms in hospital buildings that should be used with windows, the standard value of the indoor allowable noise level when the window is open should be the same as the standard value of the indoor allowable noise level when the window is closed. The time corresponding to the daytime and nighttime periods are. daytime, 6.00-22.00 hours; nighttime, 22.00-6.00 hours; or according to the regulations of the local people's government. The measurement of indoor noise level shall be carried out in accordance with the provisions of Appendix A of this specification.

1.0.4 The sound insulation and noise reduction design of civil buildings shall not only comply with the provisions of this code, but also meet the relevant current national standards.

2.1.1 A-weighted sound pressure level

Sound pressure level measured with an A-weighting network.

2.1.2 Equivalent [continuous A-weighted] sound level equivalent[continuous A-weighted] sound pressure level

Within a specified time, the A[weighted] sound pressure of a continuous steady state sound has the same mean square A[weighted] sound pressure as the time-varying noise, then the sound level of this continuous steady state sound is The equivalent sound level of the time-varying noise. The unit is decibel, dB.

2.1.3 air-borne sound

The sound source is transmitted through the air to the surrounding sound.

2.1.4 Impact sound

Noise caused by impact on building structures.

2.1.5 single-number quantity

According to the method stipulated in the national standard "Building Sound Insulation Evaluation Standard" GB/T 50121-2005, comprehensively considering the 1/3 octave bands in the center frequency range of 100Hz-3150Hz (or the center frequency range of 125Hz-2000Hz) 1/1 octave) after the sound insulation performance, the single sound insulation parameter determined.

2.1.6 weighted sound reduction index

It is a single-value evaluation quantity that characterizes the airborne sound insulation performance of building components. The weighted sound insulation should be measured in the laboratory.

2.1.7 weighted standardized sound pressure level difference weighted standardized level difference

The single value evaluation quantity of the airborne sound insulation performance between two rooms obtained by taking the reverberation time of the receiving room as the correction parameter.

2.1.8 Weighted normalized impact sound pressure level weighted normalized impact sound pressure level

The single-value evaluation quantity of the impact sound insulation performance of the floor or floor structure obtained by taking the sound absorption of the receiving room as the correction parameter.

2.1.9 Weighted standardized impact sound pressure level weighted standardized impact sound pressure level

The single-value evaluation quantity of the impact sound insulation performance of the floor

or floor structure obtained by taking the reverberation time of the receiving room as the correction parameter.

2.1.10 Spectrum correction amount spectrum adaptation term

The spectrum correction amount is the correction value that needs to be added to the airborne sound insulation single value evaluation amount due to the difference in the sound insulation spectrum and the noise spectrum in the sound source space. When the noise in the sound source space exhibits pink noise frequency characteristics or traffic noise frequency characteristics, the calculated spectrum corrections are pink noise spectrum corrections or traffic noise spectrum corrections respectively.

2.1.11 noise reduction coefficient

The single value of the sound absorption characteristics of the material obtained by calculating the measured values of the random incident sound absorption coefficient of each 1/3 octave band within the center frequency range of 200 Hz to 2500 Hz.

2.2 Symbols

C - pink noise spectrum correction amount;

C_{tr} - traffic noise spectrum correction amount;

D_{nT}, w-weighted standardized sound pressure level difference;

L_{Aeq, T} - equivalent [continuous A-weighted] sound level;

L_n, w-weighted normalized impact sound pressure level;

L_{nT}, w-weighted normalized impact sound pressure level;

NRC - noise reduction coefficient;

R_w - weighted sound insulation.

3 General Plane Anti-noise Design

4.3.9 No cultural and entertainment venues with high noise level shall be set up in commercial and residential buildings, nor shall other commercial buildings with high noise level be set up. Effective prevention and control measures should be taken for noise and vibration sources that may disturb residents in commercial buildings.

5 school buildings

5.1 Allowable noise level

5.1.1 The noise levels in various teaching rooms in school buildings shall meet the requirements in Table 5.1.1.

5.1.2 The noise level in teaching auxiliary rooms in school buildings shall meet the requirements in Table 5.1.2.

5.2 Sound insulation standard 5.2.1 The airborne sound insulation performance of partition walls and floors of teaching rooms shall meet the requirements in Table 5.2.1.

5.2.2 The airborne sound insulation performance between the teaching room and the adjacent room shall meet the requirements in Table 5.2.2.

5.2.3 The airborne sound insulation performance of the external walls, external windows and doors of teaching rooms shall comply with the provisions in Table 5.2.3.

5.2.4 The impact sound insulation performance of the floor slab of the teaching room shall meet the requirements in Table 5.2.4.

Table 5.2.4 Impact sound insulation standards for floor slabs of teaching buildings

5.3 Design of sound insulation and noise reduction 5.3.1 For school buildings located next to traffic arteries, it is advisable to arrange the sports field along the arterial road as a noise isolation zone. Between the fixed facilities that generate noise and the teaching building, there should be a noise isolation zone with a sufficient distance. When the classroom has doors and windows facing the sports field, the distance from the outer wall of the classroom to the sports field should not be less than 25m.

5.3.2 No mechanical equipment that emits strong noise or vibration should be installed in the teaching building. Other equipment that may generate noise and vibration should be kept away from the teaching room as much as possible, and effective sound insulation and vibration isolation measures should be taken.

5.3.3 For the ceiling of closed corridors, halls and stairwells in the teaching building, sound-absorbing materials with a noise reduction coefficient (NRC) of not less than 0.40 should be installed when conditions permit.

5.3.4 The reverberation time should be controlled in all kinds of classrooms to avoid adverse reflections and improve language clarity. The reverberation time of 500Hz~1000Hz in the empty field of various classrooms shall comply with the provisions in Table 5.3.4.

5.3.5 When rooms that generate noise (music classrooms, dance classrooms, piano rooms, gymnasiums) are located in the same teaching building as other teaching rooms, they should be arranged in different areas, and effective sound and vibration isolation measures should be taken.

6 Hospital buildings

6.1 Allowable noise level

6.1.1 The noise level in the main rooms of the hospital shall meet the requirements in Table 6.1.1.