

ACOUSTICS | THE NEWLY RELEASED BQSH 2018 AND WHAT YOU NEED TO KNOW

May 2018 saw the Victorian School Building Authority (VSBA) release of the updated Building Quality Standards Handbook (BQSH). Along with the new look, there are a number of changes that have been made.

This information sheet provides a summary of the main changes to the acoustic design of schools, and what it means in terms of the new or upgraded schools design.

Note that clarification should be sought as to which version of the BQSH applies to any VSBA projects that are currently in the early phases, as the new standards are being applied to current projects already underway.

SUMMARY OF MAIN AMENDMENTS

The key changes to acoustic requirements are summarised below. For the most part, the intent of the document appears the same, however the categories associated with different space types have been removed. Reference is now made to relevant Australian Standards rather than the inclusion of tables of acoustic performance requirements.

Item	Change
General	The language throughout the document has been amended to emphasise “must” and “should”. We have interpreted as ‘must’ has to be achieved and is not negotiable, but ‘should’ is to be incorporated where possible but is not essential.
Airborne sound insulation between rooms	<p>There are significant changes to this section of the document. Sound insulation requirements must be achieved, and are now based on the juxtaposition of spaces, the noise sources and receiving room tolerances.</p> <p>The sound reduction performance requirements for fixed walls have increased over the previous version. For example, classroom to classroom performance requirement has been increased by 5dB over the previous version.</p> <p>It is also identified that open plan and multi-purposes must adhere to the highest acoustic standard for intended use so as to not be functional due to noise issues.</p>
Internal noise level	The table in previous version has been deleted and the noise level ranges in AS 2107 are referenced. Internal design targets are nominally higher (i.e. less stringent) than what was previously included. For example, the classroom internal noise level was previously 30-35dBA, but in the new version would be set at 40dBA.
External noise	Information about the school siting has been included.
Reverberation time	<p>The table in previous version has been deleted and reference is made to the reverberation times in AS 2107. Reverberation times must be in the lower half of the AS2107 ranges.</p> <p>Large spaces shall have a maximum reverberation time of 1.5 seconds (such as Sports Halls).</p>
Vibration	The document now references AS ISO 2631.2, which discusses evaluation of human exposure to whole body vibration. This was not included in the previous BQSH.
Demonstration	The VSBA must be satisfied that the acoustic treatment within particular spaces is satisfactory for teaching and learning purposes.

SOUND INSULATION | SOME BQSH REQUIREMENTS HAVE BEEN INCREASED

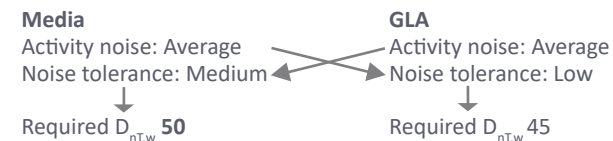
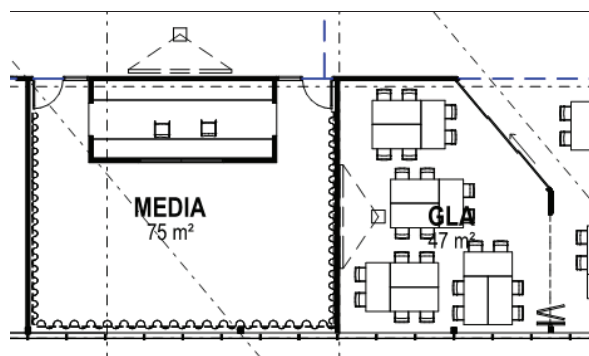
The biggest change to the BQSH document is [Table 9 Sound insulation ratings](#), which nominates the Activity Noise (Source Room) and Noise Tolerance (Receiving Room) for each space. This then informs the acoustic separation required for the spaces nominated in [Table 10 Sound insulation requirements for noise tolerance](#). The performance requirements set down for sound insulation between rooms therefore depends on the layout of the school.

This methodology is commonly used (both in the UK, and also in NSW), but the minimum on-site sound reduction targets have been increased over and above States and publications. For example, the performance standards noted in Table 10 of the BQSH are in some instances 10dB higher than the NSW EFSG guidance.

If you are not familiar with deriving sound insulation criteria in this manner, as it takes a bit to get your head around, we have included a worked example.

SOUND INSULATION RATINGS: WORKED EXAMPLE

Consider a Media space adjacent to a General Learning Area:



NOISE TOLERANCE IN RECEIVING ROOM	ACTIVITY NOISE IN SOURCE ROOM			
	Low	Average	High	Very High
High	N/A	35	45	55
Medium	40	45	50	55
Low	45	50	55	55

Table 10 Sound insulation requirements for noise tolerance

Table 9 Sound insulation ratings nominates the activity noise generated in both spaces as being 'average'. The tolerance of external noise intrusion in the Media space is rated as 'medium', while the external noise tolerance of the GLA is rated as 'low'.

The on-site sound insulation performance requirements are then taken from [Table 10 Sound insulation requirements for noise tolerance](#).

The performance of the $D_{nT,w}$ 50 wall is equivalent to the Category 5 wall in the previous BQSH. Under the previous BQSH, a Category 3 wall (or $D_{nT,w}$ 40) would have been adopted (assuming the Media room is acoustically similar to a Seminar room).

Another example of the general increase in sound insulation requirements is two general learning environments side by side. Under the previous version of the BQSH, an on-site performance of Category 3 ($D_{nT,w}$ 40) would have applied. Under the new version, this has increased to $D_{nT,w}$ 45.

OTHER NOTEWORTHY CHANGES

- Doors, glazing and on-site performance
- Operable walls
- Reverberation
- Demonstration of performance
- Hearing augmentation

WE CAN HELP YOU

If you are not sure of what this means for your project, or are embarking on a new project, please feel free to get in touch with one of our team members.

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DOORS, GLAZING AND ON-SITE PERFORMANCE

Still keeping with the sound insulation, the on-site performance is to be achieved for partitions with glazing and doors incorporated. In many instances, this would require bespoke acoustically rated doors. We don't think this is what was intended, but have asked for clarification. Until clarified, we would strongly advise not signing up to this as a project requirement. Note that the door performances included in Table 12 will not achieve the new sound insulation performance requirements.

OPERABLE WALLS

Operable walls are to be designed to achieve Table 6 (Dimensions for a bus) and Table 7 (Fencing)... We think they mean Table 9 and 10, but in any case, there are very few operable walls that will achieve the new requirement of $D_{nT,w}$ 55, and the ones that do don't generally fit within the school budget. Again, this is a significant shift from the previous version.

REVERBERATION

It will be essential to allow for extra wall and soffit absorption to achieve the requirement of 1.5s in the Sports Hall and for external covered play areas.

DEMONSTRATION OF PERFORMANCE

There is now a requirement to demonstrate the performance. Given that the requirements are specified in terms of on-site performance with flanking taken into consideration, we take this to mean commissioning testing (and rectification if required) at the project completion.

HEARING AUGMENTATION

Although the National Construction Code was amended in 2010 to include hearing augmentation in classrooms, the evidence of systems being included in school buildings has been poor. This has now been included in the ICT section of the BQSH document. The BQSH also suggests that special hearing needs, learning difficulties and students with English as a second language should have better acoustic conditions. A study in Australia of primary school children aged 5–11 years of age, found that 10.2% of children had conductive hearing loss in one or both ears, and had significantly lower ability to comprehend speech in noise than normally hearing children. There is an argument to support that we should be considering this aspect in the design of our new schools.