

Acoustic standards for classrooms

Room acoustic comfort in classrooms and recommendations regarding children with Special Educational Needs



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Introduction

The demand for good acoustics in schools has never been higher, with increasing pressure on the school estate and the conversion of existing buildings to schools just two of the challenges facing education providers.

This guide is a summary of the acoustic standards that apply to room acoustic comfort in classrooms, with particular attention to the recommendations regarding children with Special Educational Needs (SEN) It is not intended as replacement for expert advice.

Building Bulletin 93

The Department for Education has issued a number of Building Bulletins on school design, covering aspects as diverse as lighting, disabled access, and environmental assessment. The need for good acoustics in schools was recognised in 1975 with the publication BB51, "Acoustics in Education Buildings" but this was guidance rather than a mandatory standard. Scotland, whilst not having a statutory standard, usually refers to the English & Welsh Building Bulletin 93, incorporating it into the brief as a performance standard.

Until 2003 schools were exempt from Part E of the Building Regulations, and there only existed guidance for acoustic design in BB87 and its predecessor Design Note 17: "Guidelines for Environmental Design in Schools". This was historically regarded as useful guidance rather than as a mandatory standard, although BB87 formally set the standards for environmental design of schools to be met under the Education (School Premises) Regulations 1996.

Acoustic conditions in schools are now regulated through Building Regulations, School Premises Regulations, Independent School Standards and the Equality Act. Since 2003 the numerical standards and guidance used to determine compliance with these regulations are set out in DfE Building Bulletin 93 "Acoustic Design of Schools" as revised in 2014 and re-issued in February 2015.



Acoustic conditions in schools are now regulated

The BB93 standard sets classroom reverberation times for both new-build and refurbishment for a **primary school classroom / teaching area:**



Tmf seconds for
NEW BUILD



Tmf seconds for
REFURBISHMENT PROJECTS

In **secondary schools**, the standard is:



Tmf seconds for
NEW BUILD



Tmf seconds for
REFURBISHMENT PROJECTS

A significant change to the previous regulation is the provision for SEN pupils. The new criteria for **SEN rooms** are:



Tmf seconds
averaged from
125 HZ to 4 KHZ
octave bands



Tmf seconds in every
octave band in this range

In practice the absorption requirements are dominated by the lowest frequency band, which means that very high performance ceiling tiles and wall panels may be required.

Regulations

Building Regulations and Approved Documents E

Each room or other space in a school building shall be designed and constructed in such a way that it has the acoustic conditions and the insulation against disturbance by noise appropriate to its intended use.

Requirement E4 from Part E of Schedule 1 to The Building Regulations 2000 (as amended 2003)

In the Secretary of State's view the normal way of satisfying Requirement E4 will be to meet the values for sound insulation, reverberation time and internal ambient noise which are given in Section 1 of Building Bulletin 93.

Approved Document E in support of the Building Regulations

The Building Regulations apply to new schools and extensions to existing schools so any school buildings built since 2003 should comply with the acoustic standards in BB93.

School Premises Regulations and Independent School Standards

The School Premises Regulations (SPRs) and Independent School Standards (ISSs) apply to both new and existing school buildings, including the refurbishment of existing teaching and learning spaces. The School Client Body is responsible for ensuring compliance with the Regulations. The School Client Body consists of both the Commissioning Authority (which can be central government, a local authority or the School itself) and the School Entity, which is the entity having day-to-day control of the School and may be represented by the Head teacher or Governors.

Both the SPRs and ISSs contain a similar statement to that in Requirement E4 of the Building Regulations:

"The acoustic conditions and sound insulation of each room or other space must be suitable, having regard to the nature of the activities which normally take place therein."

Both sets of regulations include clarifications of what is meant by the term "suitable" and what is meant by "special requirements":

"Any requirement that anything provided under these Regulations must be "suitable" means that it must be suitable for the pupils in respect of whom it is provided, having regard to their ages, numbers and sex and any special requirements they may have."

"A pupil has "special requirements" if the pupil has any needs arising from physical, medical, sensory, learning, emotional or behavioural difficulties which require provision which is additional to or different from that generally required by children of the same age in schools other than special schools."

In addition to the design and construction standards covered by the Building Regulations, the School Premises Regulations and Independent School Standards cover the performance in use of schools. This means that operational noise levels (including noise from equipment such as whiteboard projectors and computers) in teaching and learning spaces must be suitable for the activities taking place. In addition, SPRs and ISSs require any open-plan teaching and learning spaces in new and refurbished schools to provide adequate speech intelligibility as measured by the speech transmission index (STI).

The Equality Act 2010

The Equality Act 2010 requires all schools to prepare and implement an accessibility strategy to improve the physical environment of the school for pupils with disabilities and special educational needs (SEN). This should include consideration of their particular health and safety needs on the school premises and how these can be met.

BB93:2014 Section 0.4 "Provision for children having special hearing or communication needs" provides a summary of the requirements for children having special hearing or communication needs:

For the purposes of this document, children with special hearing or communication needs may include, but are not limited to, children with permanent hearing impairment; or with severe or complex needs including:

- *speech, language and communication difficulties*
- *visual impairments*
- *fluctuating hearing impairments caused by conductive hearing loss*
- *attention deficit hyperactivity disorders (ADHD)*
- *an auditory processing disorder or difficulty*
- *being on the autistic spectrum*

BB93:2014 Section 0.4

Provision for children having special hearing or communication needs



Schools are required to improve their physical environment for pupils with disabilities and SEN

The Equality Act 2010 places a duty on all schools and local authorities to prepare and implement accessibility strategies and plans to increase over time the accessibility of schools for disabled pupils and staff. Schools and local authorities are required to provide strategies for:

- **increasing the extent to which disabled pupils can participate in a school's curriculum**
- **improving the physical environment of schools for the purpose of increasing the extent to which disabled pupils are able to take advantage of education and the benefits, facilities and services provided**
- **improving the delivery to disabled pupils of information that is readily accessible to pupils who are not disabled**

This could mean provision of physical aids and acoustic improvements which would benefit hearing impaired and other pupils.

DfE Advice on Standards for School Premises 2015

In March 2015 the DfE published the guidance document “Advice on standards for school premises for local authorities, proprietors, school leaders, school staff and governing bodies”. This refers to the requirements already described under School Premises Regulations and Independent School Standards and again refers to BB93 as the source of the appropriate acoustic criteria.

The Introduction to the Guidance states:

Many regulations state that provision must be ‘suitable’. This is not precisely defined, but schools must take into account the age, number and sex of pupils, and any special requirements they have, when determining whether provision is suitable.

Advice on standards for school premises for local authorities, proprietors, school leaders, school staff and governing bodies

It also states:

Pupils with special needs may need to be taught in spaces with lower noise levels and shorter reverberation times than in mainstream classrooms and class bases. Special schools and SEN units in mainstream schools therefore require designing to a higher acoustic standard. Where pupils with these special needs are taught in mainstream schools, the acoustics of the spaces where they are taught may need to be enhanced to the same standards as those in special units. Provision will usually be required to teach these pupils in smaller groups so that ambient noise from other pupils is lower and the distance between teacher and pupil is minimised.

Advice on standards for school premises for local authorities, proprietors, school leaders, school staff and governing bodies



Schools are required to improve their physical environment for pupils with disabilities and SEN

Other Guidance

When alterations affect the acoustics of a space then improvement of the acoustics to promote better access for children with special needs, including hearing impairments must be considered. Approved Document M: 2004 – 'Access to and Use of Buildings', in support of the Building Regulations includes requirements for access for children with special needs.

In addition BS 8300:2009 'Design of Buildings and their Approaches to Meet the Needs of Disabled People, Code of Practice' and 'Acoustics of Schools: a Design Guide' offer additional guidance:

In order to fulfil their duties under the Equality Act 2010, school client bodies should anticipate the needs of deaf and other disabled children as current and potential future users of the school.

Pupils with special educational needs are generally even more sensitive to the acoustic environment than others. Consequently, required reverberation times are shorter, sound insulation between adjacent spaces is higher and indoor ambient noise levels (and the capacity for distraction) lower than in environments for other pupils.

Pupils with hearing impairment, autism and other special needs are often very sensitive to specific types of noise, particularly those with strong tonal, impulsive or intermittent characteristics. This should be taken into consideration in the design of areas which may be used by such children.

BS 8300:2009

Design of Buildings and their Approaches to Meet the Needs of Disabled People, Code of Practice' and 'Acoustics of Schools: a Design Guide

In other words...

Irrespective of other requirements to comply with the Equality Act, **all schools must make provision for deaf pupils and others with special communication needs by:**

- Preparing strategies for meeting the needs of these pupils
- Planning how to improve access for pupils to the whole curriculum
- Providing acoustically adequate classrooms as defined in BB93

Further information

The Dept. of Education & Skills, ROI

In Feb 2013 Ireland launched its first Acoustic Performance in Schools, Technical Guidance Document TGD-021-5, and makes reference to BB93 in terms of calculating reverberation times. These times are identical for primary and secondary schools as BB93 but, make no mention of special SEN provision.

Links to key documents:

BB93 2015

www.gov.uk/government/uploads/system/uploads/attachment_data/file/400784/BB93_February_2015.pdf

Building regulations Part E

www.planningportal.gov.uk/uploads/br/BR_PDF_AD_E_2010.pdf

School Premises Regulations

www.gov.uk/government/uploads/system/uploads/attachment_data/file/410294/Advice_on_standards_for_school_premises.pdf

The Equality Act 2010

www.gov.uk/equality-act-2010-guidance

About Saint-Gobain Ecophon

Saint-Gobain Ecophon is a market leader in the design and manufacture of acoustic ceiling and wall panel systems. Passionate about the need for good acoustics, Ecophon continue to support research to demonstrate our conviction that room acoustics are an integral component of any good environment.

For more information about room acoustics, you may wish to visit

www.acousticbulletin.com

For more information about how Ecophon can help you improve your acoustic environment, visit www.ecophon.com/uk

