

Part 1: Revised Draft Response for the Scottish Schools Premises Consultation

Question 1: Do you agree that adding a link to Building Bulletin 93 for Regulation 24 (Acoustic Conditions) adequately covers the requirements for acoustic conditions? If not, why not?

BATOD Response: No.

While Building Bulletin 93 (BB93) remains the primary technical reference for acoustic design in UK schools, merely linking to it is inadequate. Its baseline acoustic standards predate, or do not fully integrate with, the current legal and pedagogical landscape in Scotland, specifically the *Standards in Scotland's Schools etc. Act 2000* (Presumption of Mainstreaming), the *Education (Additional Support for Learning) (Scotland) Act 2004*, and the *Equality Act 2010* (ALTWG, 2025; Shannan, 2020).

Relying solely on BB93's minimum mainstream standards fails to acknowledge:

- The broad and diverse listening needs of children and young people (CYP) with Special Hearing and Communication Needs (SHCN). This encompasses any level of deafness (including unilateral and mild), temporary deafness (e.g., glue ear), Auditory Processing Disorder (APD), and neurodivergent learners who struggle to listen in noise (Greenland et al., 2025).
- The shift in modern pedagogy towards peer-to-peer, collaborative learning. This approach generates significantly higher background noise than traditional didactic teaching, exacerbating the masking of speech for vulnerable listeners (Durup, 2017; Shield & Dockrell, 2004).

To ensure genuinely inclusive learning environments, BATOD proposes the following recommendations for the updated Scottish regulations:

Recommendation 1 — Reverberation Time (RT): BATOD disagrees with adopting a blanket RT standard of 0.6 seconds for all mainstream primary and secondary classrooms. While 0.6s is an improvement for some older spaces, research demonstrates that an RT of 0.6s to 1.0s leaves hearing-impaired children with a 15–20% deficit in word recognition compared to their peers (Finitzo-Hieber & Tillman, 1978; Greenland & Shield, 2019). The *BATOD Acoustics 2026* guidelines and the *Essex Study* provide strong evidence that Reverberation Time should not exceed **0.4 seconds** across the 125Hz to 4000Hz frequency bands to meet the listening needs of deaf learners (BATOD, 2026; Canning & James, 2012).

Recommendation 2 — Ambient Noise Levels and Activity Noise: The existing unoccupied ambient noise standard of 35 dB(A) LAeq must be retained to provide a quiet baseline. However, regulatory attention must urgently expand to address *occupant-generated speech noise*. Collaborative activities routinely generate noise levels exceeding 70 dB, triggering the 'Lombard effect' where occupants subconsciously raise their voices to compete with the room noise (Durup, 2017; Sato & Bradley, 2005). Building design standards must explicitly require acoustic treatments that mitigate the build-up of activity-generated noise, ensuring an occupied Signal-to-Noise Ratio (SNR) of at least +15 dB for all learners, and +20 dB for SHCN learners (BATOD, 2026; Greenland et al., 2025).

Recommendation 3 — Introduction of a Speech Clarity (C50) Standard: Currently, BB93 focuses heavily on Reverberation Time (RT), which is an incomplete standalone predictor of speech intelligibility. This consultation recommends the introduction of a mandatory Speech Clarity (C50) standard for new school buildings of **+5 dB**. C50 measures the ratio of useful early sound energy (arriving within 50ms) to detrimental late reverberant energy. While general acoustic literature suggests +3 dB as a minimum baseline for clarity, empirical measurements taken during the highly successful *Essex Study* demonstrate that when mainstream classrooms are properly treated to meet the BATOD standard (RT 0.4s), they comfortably achieve C50 levels well above +5 dB (Harvie-Clark et al., 2014). Mandating a C50 of +5 dB ensures the acoustic design delivers a high ratio of useful early reflections, matching these proven real-world conditions. This optimally supports the speech recognition needs of deaf CYP and naturally boosts the teacher's voice across the room, overcoming background noise without requiring vocal strain (Prodi & Visentin, 2022).

Recommendation 4 — Assistive Listening Technology (ALT): Acoustic design and Assistive Listening Technology (ALT) are fundamentally interdependent; one cannot compensate for the total failure of the other (ALTWG, 2025; Greenland et al., 2025). Standards for ALT must align with the newly published *Quality Standards for Assistive Listening Technology 2025*. We must move beyond legacy systems designed solely for teacher-to-learner transmission. Modern inclusive classrooms require the mandatory specification of **Wireless Remote Microphone Systems (wireless RMS)** that support two-way, peer-to-peer interaction and group discussion, enabling deaf pupils to engage equitably with contemporary pedagogical approaches (ALTWG, 2025).

Recommendation 5 — Guidance Development: BATOD recommends that the Scottish Sensory Centre (SSC) be commissioned to convene a multi-professional working group. This group must include Qualified Teachers of Deaf Children and Young People (QToDs), educational audiologists, acousticians, and deaf young people to produce detailed, regularly updated guidance on acoustics and wireless RMS specification for Scottish schools (ALTWG, 2025).

References to Support Recommendations

- **ALTWG (Assistive Listening Technology Working Group). (2025).** *Quality Standards for Assistive Listening Technology 2025*.
- **BATOD. (2026).** *BATOD Acoustics 2026 TQ V1*. British Association of Teachers of Deaf Children and Young People.
- **Canning, D., & James, A. (2012).** *The Essex Study: Optimised classroom acoustics for all*. St Albans: The Association of Noise Consultants.
- **Durup, N. D. (2017).** *An Investigation into the Effects of Classroom Acoustics on Teachers' Voices* (Doctoral dissertation, London South Bank University).
- **Finitzo-Hieber, T., & Tillman, T. W. (1978).** Room acoustics effects on monosyllabic word discrimination ability for normal and hearing-impaired children. *Journal of Speech and Hearing Research*, 21(3), 440-458.
- **Greenland, E., Harvie-Clark, J., James, A., & Shield, B. (2025).** Universal acoustic design for schools: An evidence based approach. *Applied Acoustics*, 242, 111055.
- **Greenland, E., & Shield, B. (2019).** Towards acoustic criteria for inclusion in mainstream classrooms. *Proceedings of the Institute of Acoustics*, 41(1), 172-184.

- **Harvie-Clark, J., et al. (2014).** Use of G and C50 for classroom design. *Proceedings of the Institute of Acoustics*, 36(3).
- **Prodi, N., & Visentin, C. (2022).** A slight increase in reverberation time in the classroom affects performance and behavioral listening effort. *Ear and Hearing*, 43(2), 460-476.
- **Sato, H., & Bradley, J. S. (2005).** Evaluation of acoustical conditions for speech communication in active elementary school classrooms. *Journal of the Acoustical Society of America*, 118.
- **Shannan, G. (2020).** *The Impact of Dynamic Soundfield on Delivering Improvements in Educational Attainment and Closing the Attainment Gap* (Doctoral dissertation, University of Edinburgh).
- **Shield, B., & Dockrell, J. (2004).** External and internal noise surveys of London primary schools. *Journal of the Acoustical Society of America*, 115(2), 730-738.