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The Institute of Acoustics
Consultation Response to BS 8233:2025
'Sound insulation and noise reduction for buildings – Guide'
September 2025

Introduction

The Institute of Acoustics (IOA) is the UK's professional body for those working in acoustics, sound, noise and vibration. The IOA has some 3000 members from diverse backgrounds, with engineers, scientists, educators, lawyers, occupational hygienists, architects and environmental health practitioners among their number. This multidisciplinary culture provides a productive environment for cross-fertilisation of ideas and initiatives. The range of interests of members within the world of acoustics is equally wide, embracing such aspects as aerodynamics, architectural acoustics, building acoustics, electroacoustics, engineering dynamics, noise and vibration, hearing, speech, underwater acoustics, together with a variety of environmental aspects.

British Standard 8233 *Guidance on sound insulation and noise reduction for buildings* (BS 8233) is a document that our members use regularly at various stages of a project. It is a fundamental part of residential planning policy and is relied upon for the design and construction of a wide range of non-residential buildings. In fact, it is one of the most important and widely referenced standards for UK acousticians. IOA members refer to it for the purposes of consultant advisers to developers and in the capacity of regulatory and enforcement professionals.

The IOA's aim is to provide the BSI Technical Committee B/564 – *Noise control on building sites* (B/564) with a response which aids their future deliberations to produce a standard which is robust, fit for purpose, and can be practicably applied. We can best do that by acknowledging where there are differences in member views and then faithfully presenting those views to B/564. The IOA is fortunate to be able to draw on a wealth of experience in all relevant professional disciplines for this purpose.

It is expected that B/564 will consider and test the risks/benefits of their drafting edits to take account of:

- impact on public health and well-being;
- robustness of underpinning research;
- practicability of application;
- compatibility with other existing guidance;
- appropriate criteria/parameters to cover the standard's scope and purposes;
- impact on developers/noise-sensitive receptors.

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The IOA recognises that there are strong and opposing views held on some of the proposed changes, and that this is understandable and acceptable. It also considers it inappropriate to treat issues as binary and only present one view as the 'IOA view' if a simple majority of members held those views. Presenting or not presenting a view based on numbers does not recognise that good guidance and standards are arrived at by due consideration of experience and views from all standpoints. Therefore, although member views may be described as a 'minority 'or 'majority 'view, this is reporting the contextual output from member consultation exercises and should not be interpreted as adding weight or otherwise to that position.

Background

BS 8233 has been a key document for building design in the UK since its introduction in 1987. It draws on other standards and guidance, such as BS EN 12354 Building acoustics. Estimation of acoustic performance of buildings from the performance of elements, BS EN 1793 *Road traffic noise reducing devices. Test method for determining the acoustic performance*, and the *Calculation of Road Traffic Noise* (Department of Transport, Welsh Office, HMSO), providing guidance for most building and built environment types. The document's status was changed from a code of practice to guidance in 2014.

The Draft for Public Comment version of BS 8233:2025 (referred to hereafter as the "Draft Standard"), released for consultation on 6 June 2025, remains a guidance document. As such, it offers general recommendations and does not allow for claims of compliance. It retains a similar structure, dealing with planning considerations first (Chapter 4), considering external sound (Chapter 5), before introducing a new chapter on building design objectives (Chapter 6). It retains chapters on sound insulation (Chapter 7) and sound from building services (Chapter 8). The 2025 draft places the guidance for specific types of buildings after these chapters (Chapter 9) and contains new chapters on uncertainty (Chapter 10) and sustainability (Chapter 11).

This Draft Standard proposes significant changes. While some have been widely discussed in the acoustics community for the past 12 to 18 months, others have received less attention. Most notably, the Draft Standard suggests altering the recommended approach for assessing dwellings, which includes introducing parameters not widely used in the UK. These specific changes have been publicised[1] and debated for some time.

The IOA has sought to consult members on these key amendments, specifically via an online survey from 7 March to 15 April 2025 on the anticipated major changes prior to the release of the Draft Standard, and again formally on 24 and 26 June and 2 July 2025. The responses have collectively been used to inform members' opinions of the changes, and these views have defined this formal consultation response.

General

The major proposed change in the Draft Standard is the adoption of the L_{den} and L_{night} parameters in place of the $L_{Aeq,16h}$ and $L_{Aeq,8h}$ parameters for the assessment of noise affecting dwellings.

The Draft Standard introduces a two-stage approach of first classifying the building and curtilage into a sound exposure category before recommending a façade sound insulation value dependent on this sound exposure category or alternatively a design internal level for habitable rooms. The stated basis for this change is that it arises from a review of research published over the last 20 years considering the health-based effects of noise.

This is a change from the current 2014 version, which contains guideline noise levels originating from research originally summarised in the World Health Organization document: *Guidelines for Community Noise* (1999). Contextually, it is noted that World Health

[1] Harvie-Clark, J. and Fenech, B., 2024. Aligning residential acoustic design guidance with the health evidence: a new proposal for the UK. Proceedings of INTER-NOISE 2024, Nantes, France, 25–29 August 2024. Apex Acoustics and UK Health Security Agency.

Organization *Environmental Noise Guidelines for the European Region* (2018) recommends that "all [Guidelines for Community Noise] indoor guideline values and any values not covered by the current guidelines (such as industrial noise and shopping areas) should remain valid." (p28).

In addition to these changes, the Draft Standard contains the following additional significant changes (in order of appearance in the draft *Standard*):

- The re-introduction of the speech-privacy factor in offices
- Guidance on sound insulation between cellular rooms in offices
- The addition of new guidance for the design of acoustic absorption within rooms (including a new Annex I)
- Expanded guidance on sound from building services
- Guidance on the sound insulation of open windows for overheating
- Overhaul of the calculation methods in Annex G, to align with BS EN 12354-3:2017 *Building acoustics. Estimation of acoustic performance of buildings from the performance of elements - Airborne sound insulation against outdoor sound*, to include a partial level formula for the derivation of noise intrusion via separate transmission paths, to provide calculation examples using the sound exposure categories, and to introduce formulae to define maximum open area to be used as the Equivalent Area when relying on an open window for overheating
- A new Annex J, explaining the basis for defining the sound exposure categories, the guideline dwelling façade sound insulation performance and other pertinent points relating to noise and health in dwelling design

Such a significant overhaul of a regularly used standard requires careful thought and consideration of the implications of the changes from all users, and the IOA has taken responsibility for this consultation very seriously.

The following sections address the overall opinion of the changes as expressed by members during the survey and consultations.

The online survey asked the following questions in response to the Harvie-Clarke/Fenech paper[1]:

1. Do you support the proposed shift in BS 8233 to a two-step process starting with external sound levels?
2. What is your view on the use of L_{den}/L_{night} in the revised standard?
3. What is your view on removing references to activities and room locations?
4. What is your view on removing the guidance for assessing regular individual night-time noise events?
5. Are there any other aspects of the changes you would like to comment on?

Of the 119 individual responses from the survey, 103 were consultants, 7 had a role as an engineer, 10 were defined as regulatory officers and one was an academic.

The three consultation events held following the release of the Draft Standard were in a different format to enable live debate. Over three sessions, a short synopsis of the changes was read out before attendants were placed into small breakout rooms with hosts asking the group a similar set of questions and populating a form based on the general overall response of the group. In total, 76 people attended the sessions.

A summary of opinions on each question has then been determined by examination of the responses, to inform the response in this document.

Sound Exposure Categories

The sound exposure categories are proposed to classify the noise exposure of a site. They vary depending on the transportation source and use parameters L_{den} and L_{night}.

Categorising the noise exposure of a site is not new. From the days of *Planning Policy Guidance 24: Planning and Noise* (PPG 24) (withdrawn in 2012) through to *ProPG: Planning and Noise*, which adopts a risk-based approach, such categorisation has always been accompanied by guidance on what each classification means in practice.

Overall, membership was divided on the proposal of categorising a site, with a small majority opposing the change.

Most members believe the guidance around the use of categories requires further refinement/explanation to be viable in the UK context.

There is also concern that a categorical approach to sound exposure may constrain meaningful engagement, with the risk that developments falling into upper exposure tiers could be dismissed without case-specific consideration. This was seen by some as a regressive step. This was of particular concern where developments are exposed to sound from air traffic of more than 40 dB L_{night}. The Harvie-Clarke/Fenech paper[1] suggests that:

> *For annoyance from aircraft noise, we have used the ERRs (exposure response relationships) in the WHO ENG2018 for this paper, however it is expected that the nationally-representative ERRs from a socio-acoustic study in England will be published in due course, which may be more relevant to a British Standard.*

Given the Draft Standard relates to building design and noting that the proposed sound exposure categories are formed from guidance more catered to reduce emissions, additional guidance sufficient to understand how the categories in building design are separate to how they are used in policy and master-planning is recommended.

Some members were also unclear on the precise method to establish the exposure from these sources, particularly where sites are exposed to multiple transportation sources or additional sounds from non-transportation sources.

Use of L_{den} and L_{night}

The daytime $L_{Aeq,16h}$ and night-time $L_{Aeq,8h}$ parameters are proposed to be replaced by the 24-hour annual average parameter L_{den} and the night-time annual average parameter L_{night}.

These parameters are used in the sound exposure categories, whilst the internal targets and recommended façade sound insulation values are based solely on L_{den}.

A small majority of members indicated they understood the shift toward an evidence-based approach for defining criteria. However, a notable minority expressed continued comfort with the previous $L_{Aeq,T}$ thresholds, often remarking that these "feel about right", without necessarily being able to point to specific supporting evidence to substantiate this perception.

There are concerns over the unfamiliarity of the proposed metrics, as these parameters are not currently used in the UK except in national and local policy aimed at reducing noise exposure. Their use originated in the *Environmental Noise Directive* (END) Action Plans, which in the UK have since been replaced by Action Plans prepared under the *Environmental Noise* (England, Scotland, Wales, Northern Ireland) *Regulations* (ENR). It is noted that L_{den} and L_{night} are not defined in the *Terms, definitions and symbols* section.

There is no clarity in the Draft Standard on how a practitioner may determine the exposure (e.g. is there an appropriate short-term survey method or is the proposed approach only achievable using prediction methods with annual average input data?). This should be clearly explained within the Draft Standard, and if these parameters are only achievable using prediction methods, it would leave a significant number of sites as outliers due to their exposure to mixed sound sources.

The reason these parameters are proposed is understandable, but the means to use them should be more clearly explained and thought should be given as to how the L_{night} parameter is proposed to be used.

Inclusion of a Single Internal Ambient Design Target

The 2014 version of the Draft Standard contains desirable internal ambient noise levels for living rooms, dining rooms and bedrooms in the form of annual average $L_{Aeq,T}$ for sources without a specific character. These noise levels were of a similar form in the 1999 version of the Draft Standard and were based on the recommendations of the World Health Organization document: *Guidelines for Community Noise* (1999) and re-affirmed in World Health Organization document: *Environmental Noise Guidelines for the European Region* (2018).

The Draft Standard recommends a single L_{den} internal noise level, applicable to all habitable rooms, with separate guideline noise levels for dwellings exposed by road traffic, railway traffic or air traffic. For road traffic, the internal noise level is based on the Class D rating from ISO/TS 19488: 2021 *Acoustics — Acoustic classification of dwellings*. The corresponding noise levels for railway traffic and air traffic have then been based on the difference proposed in the external sound exposure for these sources compared to road traffic.

The single noise level is proposed to reflect inclusive working/living practices, and this flexibility was seen as a positive by some members. However, the majority of members oppose the single classification of a habitable room. A common comment was the feeling that a single classification constrained good acoustic design. Others queried the point of the L_{night} external sound exposure categories when they are not reflected in any corresponding internal design target. It is recommended that the internal noise levels are revisited to consider these comments.

Individual Night-time Events

The 2014 version of the Draft Standard contained the following text:

> *Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or LAmax,F, depending on the character and number of events per night. Sporadic noise events could require separate values.*

The Draft Standard makes no mention of regular individual noise events in section 9.1.1 (the section covering dwelling sound exposure, facade sound insulation and internal ambient noise levels). There is an explanation of the omission in Annex J, whereby it states:

> *Single-event noise indicators and their distribution over time are more appropriate than long term averaged metrics to investigate such physiological effects. Nevertheless, the relationship between single-event noise indicators and long-term health outcomes at the population level remains tentative.*
>
> ...
>
> *Given the strength of the health evidence based on L_{den} and L_{night}, and the lack of evidence linking maximum sound levels with long term health effects, this British Standard does not specify maximum sound level criteria for transportation noise sources.*

There is strong support for incorporating event-based metrics like L_{AFmax} into the Draft Standard. While views differ on the robustness of the evidence, many acknowledge that the absence of conclusive data on long-term health effects does not necessarily justify omitting a target noise level altogether.

The Draft Standard acknowledges that individual noise events can elicit awakenings, albeit that translating this into a meaningful evidence-based criterion is difficult.

In light of member sentiment, it is recommended that further consideration be given to how the Draft Standard might more effectively account for individual night-time events. This should include exploring options that are both robust and health-informed, even in the absence of conclusive evidence linking such parameters to long-term health outcomes.

Other Notable Comments

Whilst not specifically commented on by members, the new guidance on internal sound insulation and office acoustic design is both welcome and necessary and reflects a real-life approach with advice that was missing in the 2014 version of the Draft Standard.

The façade sound insulation recommendations specify a minimum performance of 30 dB $D_{nT,A,tr}$. This translates to a free-field level difference of around 27 dB, which is unlikely to be achieved in most situations with non-acoustic ventilators sized to satisfy the continuous or intermittent extract fan system design in Approved Document F: Ventilation. This, therefore, is likely to mandate acoustic ventilators as standard for dwellings, which does not appear to be a sustainable approach where sites are classified as Category 1 (circa. ≤ 53 dB $L_{Aeq,16h}$/47 dB $L_{Aeq,8h}$ for road traffic). It is recommended that this mandatory minimum standard is removed.

There is concern that the Draft Standard includes the annual average L_{den} and L_{night} parameters and does not discount the use of strategic noise maps as the basis of defining the sound exposure for a site. Due to the limitations associated with the ENR strategic noise mapping (only includes high trafficked roads, busy railways and major airports/agglomerations, noise levels are calculated at a height of 4 m, single diffraction edge screening only, no inclusion of local/other sources, fixed grid of 10 m x 10 m), site-specific assessments are considered essential. The Draft Standard should be more explicit in this regard.

Whilst better guidance on room acoustic absorption is welcome, some members have queried the reasoning behind defining the room absorption area. This is particularly so given that the Draft Standard refers to other guidance documents that cover most building typologies/situations. It is recommended that this guidance is revisited, to be consistent with the referred guidance documents, which are supported by an evidence base.

Some members were disappointed with the lack of guidance around an approach for non-transportation sources. Whilst there may be a lack of health-based evidence, members felt some guidance formed from opinion was better than none.

Some members commented on the lack of objective criteria in the external amenity area section (9.1.3). It is acknowledged that, to an extent, the sound exposure categories cover this. A link to an objective measure may be beneficial.

Conclusion

We welcome the opportunity to comment on a Draft Standard so fundamental to our working life.

The IOA will always support research which contributes to understanding the impact of noise exposure on health and well-being. Therefore, we would expect any revision to standards to be evidence-based. Some members specifically expressed their support for the evidence-based approach to this *Standard*'s revision, but the process and implementation require better explanation, and some aspects (e.g. room classification and single event noise levels) should be overhauled if they are to align with members opinion. Furthermore, the *Standard* must consider the practical implementation of what is being recommended, and ensure the guidance is both repeatable and reproducible in real-life situations.

Given the fundamental role of BS 8233 and the level of opposition to certain changes, BSI may wish to consider a second consultation process once comments have been reviewed and addressed.

If officials would like to explore further any of the points raised, relevant members of the IOA would be delighted to meet with them.

This response has been prepared by James Healey, Chair of the Building Acoustics Group, assisted by Ben Burgess of the Building Acoustics Group, alongside members of the IOA who are experienced practitioners in this area. The IOA members consultation process has been overseen by Daniel Goodhand. This response has been approved by the IOA's Governing Council.

Alistair Somerville

Immediate Past President

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