CIEH BS8233 Draft Document Comments

Foreword and Scope

The document removes reference to the use by non-specialist designers and constructors of buildings, building control, planning and environmental health.

The main uses of the existing document are for those three groups. The document later references planning and building control legislation. It appears strange to remove these from the foreword as the main purpose of the document being for these uses.

Reference to Environment (Air Quality and Soundscapes) (Wales) Act 2024 and WHO Environmental noise guidelines for the European Region 2018 appear strange in isolation. The Environment (Air Quality and Soundscapes) (Wales) Act 2024 is not part of core planning/building control legislative or policy frameworks for the UK. And the WHO guidelines 2018 are not widely adopted as standards within the UK building industry, as opposed to WHO Guidelines 1999 that are widely applied by custom and practice, and endorsed by significant case law, and planning appeal decisions.

It would be more appropriate to reference:

- *National Planning Policy Framework England*
- *Planning Practice Guidance [online] resource England*
- *Planning Policy Wales*
- *The Strategic Planning Policy Statement (SPPS) (Northern Ireland)*
- *National Planning Framework 4 (Scotland)*

And associated building control requirements:

- *Building Regulations and codes of practice England/Wales*
- *Building Regulations (NI)*
- *Building Standards Scotland*

Introduction

The introductory section advises on the interaction between people and various sound sources and the variability of the impact of diverse sounds on different demographic groups within society. Compared to the existing document, the revision reads like a research paper rather than a technical guidance document.

The introduction appears to suggest that setting standards will generically ensure building occupiers are protected. It should be noted that building occupation cannot be determined by regulation as, except for purpose designed and constructed dwellings that may support those with mental and physical health needs, the general use of a building is dictated by the occupier and often modified after construction to better reflect needs. Advice on perception of sound and use of buildings may only ever be of very limited value in a general guidance document as the actual impact is dictated on a local specific level.

We would recommend these aspects are removed or revised to explain that the standard relates to normal use and that specific guidance should be sought for specific types of use or occupation e.g. buildings for use by people with special needs.

The original text in paragraph 0 would appear to be still appropriate and sufficient.

Section 1 Scope

The scope and the standard are not clear in that the title refers to Sound Insulation and noise reduction for buildings and the scope refers to the design of new buildings or redesign or refurbishment of new buildings. The scope does not refer to urban planning and the design of development sites. Later sections, however, refer to the design of development sites.

The standard should be clear on whether it applies to the design of new buildings or whether it provides planning guidance. If the standard is to be used as planning guidance, then the document needs to be substantially revised and clearly explain how it relates to national planning policies and other planning guidance including, but not limited to, the Professional Practice Guidance: Planning and Noise (May 2017). Please also refer to our comments on Sections 4 and 9.

Section 2 Normative references

Whilst the format and approach to redrafting the document are a matter of written preference, the document continues to reference several other British and ISO Standards, it would be helpful to retain these references in full as they impact on interpretation of BS8233.

Section 3 Terms Definitions and symbols

No comments

Section 4 Planning Considerations

Section 4 is not consistent or compatible with national planning policies. The process and stages are incomplete and fall short of a good acoustic design process and the steps/ measures that should be considered as part of good acoustic design.

4.1 Policy

This section seems to imply that the standard provides guidance on planning. If the standard is to be used as planning guidance, then the document needs to be substantially revised and clearly explain how it relates to national planning policies and other planning guidance including, but not limited to, the Professional Practice Guidance: Planning and Noise (May 2017) (“the ProPG”).

Having single, fixed design target levels is not consistent or compatible with the Noise Policy Statement for England, Planning Practice Guidance for Noise or the ProPG. The aims of the NPSE are to:

- avoid significant adverse impacts on health and quality of life.
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

The standard does not explain how the noise design targets relate to these different policy aims and how they should be applied. For example, do the internal noise target levels specified in Section 9 represent either a LOAEL or SOAEL? Should they be applied as a fixed target level or can there be any flexibility having regard to local and site-specific circumstances? Planning Practice Guidance for Noise states that *"Plans may include specific standards to apply to various forms of proposed development and locations in their area. Care should be taken, however, to avoid these being applied as rigid thresholds, as specific circumstances may justify some variation being allowed."* This suggest that noise standards should be set at the local level and provide flexibility, which is not consistent the current draft of the standard. The ProPG refers to different target levels that relate to the LOAEL and SOAEL and explains how flexibility can be applied to different areas and different sites according to local need and context.

Neither is this section accurate. For example, noise is not a material consideration in the case of all buildings or development sites.

Our position is that the standard should not provide guidance on planning and all references to urban planning and site development should be removed and simply refer to other planning guidance such as the ProPG. If the BSI committee disagrees then it should be substantially rewritten so that it is consistent and compatible with national planning policies. As a matter of principle, the standard needs to be entirely consistent and compatible with other planning guidance such as the ProPG.

Section 4.2

The standard should be clear on whether it relates to the design of new buildings or the design of development sites. If it relates to the design of new buildings, then Section 4 needs to be constrained to deal only with matters relating to the design of buildings. If it is to address the design of development sites, then it needs to be substantially revised to reflect a good acoustic design process as described below.

The hierarchy of noise control measures set out below reflects a good acoustic design process. . I t is suggested the following text is used to introduce Section 4 and that the whole of Section 4 is restructured and revised accordingly.

"Hierarchy of noise control measures

- *Maximising the spatial separation of noise source(s) and receptor(s).*
- *Investigating the necessity and feasibility of reducing existing noise levels and relocating existing noise sources.*
- *Using existing topography and existing structures (that are likely to last the expected life of the noise-sensitive scheme) to screen the proposed development site from significant sources of noise.*

- *Using non sensitive elements and buildings to screen other parts of the development site.*
- *Using the layout of the scheme to reduce noise propagation across the site.*
- *Using the orientation of buildings and the orientation of rooms within buildings to reduce the noise exposure of noise-sensitive rooms.*
- *Incorporating noise barriers as part of the scheme to screen the proposed development site from significant sources of noise.*
- *Using the building envelope to mitigate noise to acceptable levels e.g. acoustic balconies and innovative façade and window designs.*

Mechanical ventilation and cooling should only be used as a method of last resort and should not be considered as an alternative or substitute for any of the above measures. The buildings should be designed to allow the occupants to open windows as far as reasonable whilst minimising noise levels indoors. Mechanical ventilation and cooling should only be used as a supplementary method if internal noise target noise levels cannot be fully achieved through the noise control hierarchy.

The above noise control measures should not be considered in isolation. A holistic design approach is required to optimise internal living conditions having regard to all the factors that could affect health and quality of life, including:

- *Indoor air quality,*
- *Ventilation,*
- *Privacy,*
- *Security,*
- *Thermal comfort,*
- *Personal control over internal living conditions,*
- *Views, and*
- *Connectivity with the external environment.*

A process of good acoustic design can be demonstrated via an Acoustic Design Statement (ADS), as detailed in ProPG: Planning and Noise [reference], or alternative methods that satisfy national or local planning requirements."

Section 4.4. Design sound criteria

Again, section 4.4 places too much emphasis on sound insulation and does not reflect a good acoustic design process. Section 4.4. should be reduced in scope or expanded to reflect whether the standard is to applicable to the design of development sites rather than simply buildings (see earlier comments on Scope.) Even if the standard to limited to the design of new buildings, Section 4.4. does not reflect all the design measures that should be considered as part of a good acoustic design process.

Section 4.5 Sound control measures

Section 4.5 needs to be substantially restructured and revised to reflect the comments above in relation to Sections 1 and 4 and to properly reflect the hierarchy of noise control measures set out in our comments on Section 4.2.

In terms of addressing each of the steps set out in the noise mitigation hierarchy we would refer you to Supplementary Document 2 of the ProPG on Good Acoustic Design.

4.5.5 Sound insulation of the building envelope

A distinction should be made between the mitigation options that can be used at or inside the building e.g. room orientation,acoustic balconies and the level of façade insulation.

We agree that façade insulation with windows closed should be a measure of last resort as set out in the noise mitigation hierarchy (see Section 4.2).

Section 5 External Sound Sources

Section 5 does not provide clear guidance whether calculated external noise levels or noise measurements should be used for design purposes. Section 5.1. provides some general guidance on whether sound levels, predictions or a combination of both should be used for design purposes. 5.2.2 gives guidance on the calculation of road traffic noise and nothing on noise measurements. Is the inference that calculation by itself is sufficient for road traffic noise? If so, this is something we would not agree with. By contrast, 5.3.2 on the prediction of sound from aircraft states that sound exposure data should be obtained from on-site sound measurements.

Section 5 should be significantly revised to give clear guidance on when noise predictions and noise measurements should be used for design purposes. Wherever possible, the standard should refer to other standards and guidance e.g. BS7445.

In addition, parts of Section 5 are inconsistent with Section 9. For example, 5.3.2 recommends that it might be necessary to design the building envelope for those operational days when the noise exposure at a particular location might be higher than implied by noise contours. This is advice that we agree with when there is significant variability on the source noise levels and not just for aircraft noise. The main point however is that this guidance is not consistent with Section 9 and the current reliance on Lden and Lnight, which are annual average parameters.

Section 5.3.3 is unhelpful. We suggest this is deleted and that drones and other novel aircraft are added as an exclusion in the scope of the standard.

Section 5.7 needs to be updated to reflect the proposed changes to ETSU-R-97.

Section 5.8 is unhelpful. As with drones, the other sources listed should be added to the list of exclusions in the scope of the standard.

Section 6 – no comments.

Section 7 Sound Insulation in a Building

7.4.5 Windows

It is beyond the scope of the standard to address Indoor Environmental Quality.

These matters are addressed through regulation and local plans/ standards e.g. the London Plan and associate guidance on air quality for design. The standard should refer to regulations and other documents where appropriate, including the ProPG which advocates a holistic design approach.

The section itself on windows is unhelpful and should be expanded to include information when windows are open and closed. For example, the standard could refer to NANR116, authored by Edinburgh Napier University.

It is recommended that the first paragraph is deleted and replaced with the following:

"The window design will need to satisfy different building regulation requirements and standards covering various aspects of the building e.g. safety, security, air quality, thermal performance, overheating and ventilation. The extent to which windows are open or closed will depend on the overall strategy for managing the effects of indoor air quality, ventilation and overheating. The level of noise entering buildings should be evaluated in the context of different design requirements and the strategy for managing the indoor comfort of the occupants. This information should be sought from the design team to inform the assessment of the level of noise ingress through windows and other façade elements. Windows should not be assumed to be closed for acoustic purposes if the overall strategy for achieving internal living conditions requires windows to be open. Equally, windows should not be assumed to be fully open if they are likely to be restricted for other reasons such as falling from height."

7.4.5.2 Ventilation

It is outside the scope of the standard to give guidance on ventilation. Neither do we agree with the interpretation that has been given to the Approved Documents. This section should be deleted and replaced with simple references to building regulation requirements. References to building regulations and other standards should be factual with the use of direct quotes.

The reference to the Acoustics, ventilation and overheating: Residential design guide [55] should be removed. If it is necessary and relevant to the scope of the standard, then it should be specified in the standard itself rather than cross referring to other documents. As it stands, the guidance referred to is controversial and is not endorsed by the CIEH.

7.4.5.3 Overheating

We do not agree with this section and the interpretations that have been given to the Approved Document O. Any reference to the Approved Document O should be purely factual and use direct quotes. In particular, we recommend that Sections 2.10 and 2.11 are quoted verbatim, with an emphasis given to the fact that mechanical cooling should only be used as a method of last resort and "*It should be demonstrated to the building control body that all practicable passive means of limiting unwanted solar gains and removing excess heat have been used first before adopting mechanical cooling."*

Section 3.2 to 3.4 should also be referred to.

References to The Acoustics, ventilation and overheating: Residential design guide should be removed. This guidance document is controversial and is not endorsed by the CIEH.

Section 8 – no comments.

Section 9 Specific Types of Buildings

Table 8 Sound Exposure Categories are of some concern. The SEC is trying to set categories of façade limits for various types of noise source. These limits as reference levels would appear to effectively be a mixture of impact assessment screening levels aligned to 'creation of government policy'. The SECs are similar to the PPG24 Noise Exposure Categories in use in until 2012, when the NPPF was introduced and deliberately removed a generic numeric approach. The SEC's effectively seek to introduce planning policy which is not the role of a British Standard.

Section 9.1 Dwellings and rooms in residential use

We strongly object to the proposals to introduce the simplified method and façade insulation design. We consider these proposals to be regressive and incompatible with the Professional Practice Guidance (ProPG): Planning and Noise for New Residential Development. We do not consider that the proposals represent a good acoustic design process. As such, the proposals are incompatible with national planning policy for England.

As a matter of principle, the revised BS8233 should be consistent and compatible with extant guidance such as the ProPG.

Tables 10 and 11 are seeking to replicate or interpret Building Regulations. It is outside the scope of this standard to provide guidance on ventilation and overheating. Tables 10 and 11 are either unnecessary if they replicate codes of practice or unhelpful if they diverge from those codes.

We would ask therefore that Tables 8, 9 and 11, and all the associated text, are removed from the standard. The CIEH will not endorse the standard if these proposals are not removed from the revised standard.

We recommend that the first paragraph, including bullet points a) and b) and associated footnotes are deleted and replaced with the following text.

Suggested text

"A good acoustic design process should be used to minimise noise levels in and around dwellings and other buildings used for residential purposes as far as reasonably practical. The following hierarchy of noise control measures shall be used to minimise noise levels:

- *Maximising the spatial separation of noise source(s) and receptor(s).*
- *Investigating the necessity and feasibility of reducing existing noise levels and relocating existing noise sources.*
- *Using existing topography and existing structures (that are likely to last the expected life of the noise-sensitive scheme) to screen the proposed development site from significant sources of noise.*
- *Using non-sensitive elements and buildings to screen other parts of the development site.*
- *Using the layout of the scheme to reduce noise propagation across the site.*
- *Using the orientation of buildings and the orientation of rooms within buildings to reduce the noise exposure of noise-sensitive rooms.*
- *Incorporating noise barriers as part of the scheme to screen the proposed development site from significant sources of noise.*
- *Using the building envelope to mitigate noise to acceptable levels e.g. acoustic balconies and innovative façade and window designs.*

Mechanical ventilation and cooling should only be used as a method of last resort and should not be considered as an alternative or substitute for any of the above measures. The buildings should be designed to allow the occupants to open windows as far as reasonable whilst minimising noise levels indoors. Mechanical ventilation and cooling should only be used as a supplementary method if internal noise target noise levels cannot be fully achieved through the noise control hierarchy.

The above noise control measures should not be considered in isolation. A holistic design approach is required to optimise internal living conditions having regard to all the factors that could affect health and quality of life, including:

- *Indoor air quality,*
- *Ventilation,*
- *Privacy,*
- *Security,*
- *Thermal comfort,*
- *Personal control over internal living conditions,*
- *Views, and*
- *Connectivity with the external environment.*

Note 1A process of good acoustic design can be demonstrated via an Acoustic Design Statement (ADS), as detailed in ProPG: Planning and Noise [reference], or alternative methods that satisfy national or local planning requirements."

We consider the proposals for sound level targets inside habitable rooms are not necessary or appropriate. It is not the responsibility of the BSI committee to give advice on sound level targets. This is the responsibility of national governments or other responsible bodies. We would therefore recommend that the existing internal target levels are either removed or otherwise retained and unaltered.

If, however, the BSI Committee disagrees with us on this point then we would recommend that the internal target levels are updated as follows:

- Internal target levels should be expressed using the L_{Aeq} (day and night) and L_{max} parameters (L_{den} should not be used for design purposes),
- Specific internal target levels should be provided for bedrooms and habitable rooms,
- The internal target levels should be derived assuming 15dB attenuation for an open window,
- The evidence on objective sleep disturbance should be used to inform the L_{max} criterion,
- The latest and most relevant scientific evidence should be used rather than the generalised exposure response relationships derived by the WHO for Europe (WHO ENG 2018 and supporting evidence reviews),
- In accordance with WHO recommendations, UK exposure–response curves should be applied whenever possible to assess the specific relationship between noise and annoyance in a given situation (see WHO 2018 guidelines, page 109). Specifically, for aircraft noise, the UK SONA study (published in 2017) should be used,
- Noise target levels are consistent with the recommendations from government and government bodies, including the CAA and the Interdepartmental Group on Costs and Benefits (Noise Subject Group) (ICB(N)). We consider that the generalised ERRs are not representative for railway noise in the UK. There are good reasons to suggest that the annoyance response to railway noise is better than other countries and there is little to suggest that railway noise has now become more annoying than road traffic noise in the UK. For these reasons, we should only be using recent generalised ERRs if the UK government intend to rely upon them to update guidance documents such as the DMRB and webTAG.

9.1.3 Design criteria for external sound

The reference to seeking advice from Environment Agency and CIEH on individual development is incorrect, it needs to refer to local environmental health departments and other local stakeholders on a case-by-case basis.

The reference to Soundscape being more important than absolute levels is not agreed and this sentence should be deleted.

References to the soundscape assessment could lead to disproportionate assessment, especially if the intent is to recommend or imply formal assessment of soundscape using ISO 12913-1:2014 - Acoustics — Soundscape. We would suggest that the last sentence of paragraph 1 is replaced with:

"Consideration of the soundscape, as part of the evaluation of the sound in context, may be appropriate in some circumstances."

The final paragraph is not accurate. We would recommend that the final paragraph is deleted and replaced with the following.

"A good acoustic design process should be used to minimise noise levels in external areas used for amenity space, as far as reasonably practical, using the same mitigation hierarchy as that set out in Section 9.1.2 above.

Note 1A process of good acoustic design can be demonstrated for external amenity areas via an Acoustic Design Statement (ADS), as detailed in ProPG: Planning and Noise [reference], or alternative methods that satisfy national or local planning requirements."

Paragraph 9.2 extension of table 13 to include sensory rooms is welcomed.

Section 10 Uncertainty

Reference should be made to ISO-1996, which provides extensive guidance on measurement uncertainty.

BS7445 is also being updated and will include guidance on uncertainty. We recommend liaison with EH/1/3 to ensure the standards are consistent with each other.