

KILDARE COUNTY COUNCIL - Noise from Transportation Sources

Summary of Planning Advice Note for Applicants, Consultants and Planners.

Excessive environmental noise can be harmful to the health and quality of life of individuals and communities in residential settings. The potential impact of transportation noise on likely occupants should be considered at the early stages of the planning process for new residential developments.

A principle aspiration in the design of new residential development should be the application of **good acoustic design** so that:

- (a) internal noise level guidelines, as outlined in BS 8233:2014¹, can be achieved with adequate building ventilation and thermal comfort, in all living areas (e.g. living rooms, bedrooms) with openable windows;
- (b) private external amenity areas can be enjoyed as intended taking cognisance of environmental noise levels recommended not to be exceeded by the World Health Organization (WHO).

In achieving this aspiration it is recommended that planning applicants, developers and their acoustic engineers apply the approach taken in the English guidance document *Professional Practice Guidance on Planning and Noise: New Residential Development* (ProPG, 2017) and that they also refer to the Irish guidance document *National Guidance for the Consideration of Transportation Noise in the Design of New Residential Development*. The ProPG approach may also be applied to the design of other types of noise sensitive developments as well (e.g. educational facilities, hospitals, care homes).

The primary goal of ProPG is to “assist the delivery of sustainable development by promoting good health and well-being through the effective management of noise”. The guidance advocates a systematic, proportionate, risk based, **two-stage approach** that facilitates straightforward accelerated decision making for lower risk sites assists the proper consideration of noise issues where the acoustic environment is more challenging.

The transport noise sources that should be considered are at the discretion of the relevant planning authority but should at least be those included in the latest strategic noise mapping, prepared in accordance with the *Environmental Noise Regulations*. Where the applicant is unsure of whether to consider the effects of a particular transport source on a proposed residential development then they should contact their relevant planning authority for clarification.

Stage 1 Initial Noise Risk Assessment

Stage 1 is an **Initial Noise Risk Assessment** for the site of the proposed residential development. It will provide an indication of the likely risk of adverse effects to occupants from transport noise (Negligible, Low, Medium or High noise risk) without the consideration of any additional noise mitigation measurements than those already present. Noise levels for the determination of noise risk can be measured or predicted to estimate long-term day-time and night-time noise levels effecting the site.

Where the noise risk is deemed to be less than Negligible then there is unlikely to be any objection to the proposed development by the planning authority based on noise grounds. As the noise risk increases then the acoustic environment is likely to be more challenging and greater detail will be required to be submitted with the planning application to demonstrate how adverse impacts will be minimised and reduced and that significant adverse effects will be avoided across the completed development. Where there is High risk across the site then there is increased potential that the proposed development will be refused by the planning authority based on noise grounds. However, the outcome of the Stage 1 assessment is not the basis of refusal, only to emphasise the acoustic challenges that exist.

The Stage 1 assessment can be carried out by the planning applicant or developer where strategic noise mapping is available, but they should refer to the both the *National Guidance for the Consideration of Transportation Noise* and *ProPG*. Where strategic noise mapping is available then Table A1 in Appendix 1 can be referred to for the potential suitability for a new residential development based on the noise risk.

Stage 2 Full Assessment

Where the Stage 1 assessment indicates that the noise risk is greater than Negligible at the site of the proposed development then a **Stage 2 Full Assessment** should be conducted by an acoustic engineer based on a combination of predicted and measured noise levels and an **Acoustic Design Statement (ADS)** prepared (see Appendix 1, Tables 1 and 2). There are four key elements in the **Stage 2 Full Assessment** which should be carried out in tandem.

Element 1 is the over-arching element of **good acoustic design**, which should be used to achieve optimal noise conditions in both internal habitable rooms (e.g. living rooms, bedrooms) and in external amenity areas. Importantly, ProPG indicates that unopenable glazing is generally unsatisfactory and that solely relying on the sound insulation of the building to achieve acceptable acoustic conditions when other measures could be applied is not regarded as good acoustic design. Any reliance on closed windows to achieve internal noise level guidelines will require justification and should be accompanied with a proposed

¹ BS 8233:2014 *Guidance on sound insulation and noise reduction for buildings*.

ventilation and overheating strategy for the building(s). The acceptability of closed windows to achieve desirable internal noise levels inside should be agreed with the planning authority. It is recommended that planning applicants, developers and their acoustic engineers review any relevant local policies and engage with the relevant planning authority at an early stage to discuss any acoustic issues that are encountered.

Element 2 is an assessment of expected internal noise levels in the proposed buildings. Recommended guidance for target internal noise levels in noise sensitive rooms are set out in BS 8233:2014.

Table 1. Target internal noise levels for outlined in BS8233 and (additions in ProPG in blue italics).

Activity	Location	07:00-23:00 hrs	23:00-07:00 hrs
Resting	Living room	35 dB <i>LAeq,16hr</i>	-
Dining	Dining room/area	40 dB <i>LAeq,16hr</i>	-
Sleeping	Bedroom	35 dB <i>LAeq,16hr</i>	30 dB <i>LAeq,8hr</i>
(Daytime resting)			45 dB <i>L_{Amax,F}</i>

A series of notes accompany the tables in BS 8233:2014 and ProPG that should be given consideration. A detailed assessment should be carried out where this criteria may be exceeded. ProPG highlights that residents value the ability to “*open windows at will*” and so it is reiterated that it is recommended to investigate the feasibility of achieving optimal acoustic conditions with openable windows.

Element 3 is an assessment of noise levels in the external amenity areas of the proposed residential development. Cognisance should be given to recommended external amenity noise levels not to be exceeded in BS8233:2014 and the *Guidelines for Community Noise* (WHO). Where it is agreed with the planning authority that desirable external noise levels cannot be achieved then evidence should be provided that all facets of good acoustic design have been applied and access is provided for those effected to a private amenity area with desirable amenity areas (e.g. a quiet balcony or roof area for residents where there is an apartment block in an urban area). However, cognisance should be given to vulnerability of the proposed occupants of the development (e.g. residential care homes).

Element 4 is a consideration other relevant issues such as national and local policies to aid the planning authority make a decision on the proposed residential development. The planning applicant and/or developer should contact the relevant planning authority to discuss any issues that arise.

It is recommended that the planning applicant, developer and/or acoustic engineer refer to the *National Guidance for the Consideration of Transportation Noise in the Design of New Residential Development* in the undertaking of the *Stage 2 Full Assessment* because it highlights certain recommendations in ProPG that may require a cautionary approach (e.g. the suitability for internal noise levels to exceed target levels in BS 8233:2014).

Acoustic Design Statement

An **Acoustic Design Statement** (ADS) should be provided with all planning applications for proposed residential developments with greater than Negligible noise risk as determined under the *Stage 1: Initial Noise Risk Assessment*. The ADS is required to demonstrate that the elements of the *Stage 2: Full Assessment* have been appropriately followed. Typical issues that should be addressed in an ADS based on the noise risk identified from the Stage 1 assessment are highlighted in Table A2 of Appendix 1.

Applicants and developers seeking an acoustic engineer to guide them in the consideration of acoustics and new residential development should ensure that they have specialist training, up to date knowledge, appropriate experience and access to survey equipment and calculation software if necessary.

Ventilation and Overheating

The Building Regulations (Part F Amendment) Regulations 2019 (S.I. No. 263 of 2019) provide details on the ventilation requirements for new residential buildings in Ireland. However, the provision of adequate ventilation will not necessarily provide thermal comfort for occupants and prevent overheating. Where it is agreed with the planning authority that closed windows are appropriate to achieve target internal noise levels then a ventilation and thermal cooling strategy should be prepared that assesses impacts on internal noise levels by both external transportation noise and any internal noise from any mechanical ventilation services.

Mechanical ventilation systems can be very resource intensive and increase energy use in buildings. A hierarchal approach should be taken for the selection of any thermal cooling strategy prioritising one that provides optimal cooling using the least energy. The ventilation and thermal cooling strategies should be consistent with the strategy to achieve internal noise level guidelines to allow occupants to achieve optimal acoustic comfort, appropriate ventilation and thermal comfort simultaneously.

Appendix 1. Tables in the consideration of noise risk and issues to be addressed in an Acoustic Design Statement

Table A1. The suitability for a new residential development based on the noise risk determined from the *Stage1: Initial Noise Risk Assessment* outlined in ProPG.

Type of Development	Predicted Noise Level	Noise Risk
<ul style="list-style-type: none"> • New residential development • Extensions to existing residential estate including refurbishment and upgrade • New one-off dwellings (extensions significantly increasing the design population equivalent) • Any change of use to residential • Commercial development where transportation noise has the potential to disturb workers • Other potential noise sensitive buildings (e.g. schools, hospitals, care homes) 	<p>Generally ≥ 55 dB L_{den} / ≥ 45dB L_{night} for road and railway noise based on strategic noise mapping, predictions and/or measurements.</p> <p>Generally ≥ 45 dB L_{den} / ≥ 40dB L_{night} for noise from major airports based on predictions and/or measurements. Where noise based predictions or measurements are not available then at least Medium noise risk should be assumed where levels exceed ≥ 55 dB L_{den} / ≥ 50dB L_{night} based on strategic noise mapping.</p>	<p><u>Low to High Noise Risk</u> (determined based on Figure 1 of this document)</p> <p>A Stage 2: Full Assessment necessary to be contained within an Acoustic Design Statement (ADS). The detail of the ADS will be greater with increased risk (see Table 2 for issues for consideration).</p> <p>Where the site is identified to be at a Low noise risk from the Stage 1 assessment then it is likely to be suitable from a noise perspective provided that the process of good acoustic design is followed and demonstrates how adverse effects will be mitigated and minimised.</p> <p>As the noise risk increases to Medium then the less likely the site will be suitable from a noise perspective and any application may be refused unless good acoustic design is followed and demonstrates how adverse effects will be mitigated and minimised and clearly demonstrates that significant adverse effects will be avoided.</p> <p>Where there is High risk identified at the site from the Stage 1 assessment then there is an increased risk that the proposed development may be refused on noise grounds. This risk may be reduced by following good acoustic design.</p>
<ul style="list-style-type: none"> • Same as above 	<p>Generally < 55 dB L_{den} / < 45dB L_{night} for road and railway noise based on strategic noise mapping, predictions and/or measurements.</p> <p>Generally < 45 dB L_{den} / < 40dB L_{night} for noise from major airports based on predictions and/or measurements.</p>	<p><u>Negligible Noise Risk</u></p> <p>There will <i>unlikely be an objection to the proposed residential development by the planning authority.</i></p>

Table A2. Issues to be addressed in an Acoustic Design Statement (ADS) where the noise risk is determined from the Stage 1: Initial Noise Risk Assessment outlined in ProPG.

Typical issues for low noise risk sites	Additional issues for medium/high noise risk sites
Identify relevant noise sources	Identify and quantify multiple noise source contributions
Assess the extent of noise risk for the unmitigated site (current and foreseeable future, 15 years ahead)	Consider the effects of noise across the site (all buildings, all relevant heights)
	Alternative site layout considered
	Use adequate non-sensitive buildings for screening
Identify opportunities to mitigate the noise source within the site	Identify opportunities to mitigate the noise source outside owned land e.g. physical mitigation
Maximise separation distances	Consider existing topographical advantages e.g. change site level
Consider the necessity for noise barriers ² and screening opportunities	Consider the need to provide barriers ² inside the site
Consider the site layout and protecting residential units	Design the external amenity spaces (e.g. balconies) to reduce noise entering sensitive rooms
Consider the site layout and protecting external amenity space	Access to quiet open space on or off site
Use non-sensitive elements designed as screens	Use non-sensitive rooms to screen noise
Use building layout to self-screen sensitive rooms	Orientate noise sensitive rooms away from the source of the noise exposure i.e. quiet façades
Provide building treatment to screen openings	Consideration of alternative acoustic options
Consider window location and size on affected façades	Innovative façade and window designs e.g. use of acoustic fins to provide shelter
	Consider façade insulation design
Consider ventilation – natural, from quiet façade	Consider acoustic performance of ventilation, thermal comfort
	Complete the acoustic design process throughout

NOTE 1

This advice notes covers;

- noise impact from existing transportation corridors on proposed development (i.e.) inborne noise to the proposed development
- foreseeable noise impact from proposed (future) transportation corridors (when known) and where there is a reasonable prospect of noise impact from such development in the lifetime of the proposed development.

It does not cover;

- environmental noise from sources that would not normally be described as transportation corridors which are covered by their own relevant guidance and legislation.
- noise generated by the development premises itself (outborne noise from the development itself).

NOTE 2

The choice of location and duration for noise measurements must be explained clearly in the report. All raw measurement data should be included in Appendices and summarized as appropriate in the body of the report. Where information is not provided or is incomplete or is difficult to determine from reasonable examination of a submitted report, clarification or additional information will be requested. Applicants are advised to keep the pertinent information accessible within the report for ease of the planning assessment process.

² Acoustic barriers should have the appropriate CE marking (*EN 14388:2015 Road traffic noise reducing devices - Specifications*).