

Limiting neighbourly noise

Until clause G6 of the Building Code is revised, mitigating noise between medium-density dwellings falls to the designer and builder. Steps at the planning stage can avoid headaches later.

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MEDIUM-DENSITY HOUSING stands at the crossroads between our traditional understanding of stand-alone dwellings and apartments.

Housing New Zealand's *Best practice in medium density housing design* suggests that medium-density housing needs to 'give rental housing some of the external trappings of owner-occupied housing'.

If successful, this raises occupants' expectations of acoustic privacy. If they are then greeted with apartment-like noise intrusion, dissatisfaction can follow.

The din of everyday life

As medium-density housing brings neighbours closer together, it also brings normal living noises closer. These include noise from immediate neighbours, recreation, heat pumps, vehicles on driveways, and voices and footsteps from people on walkways and common outdoor spaces.

The Building Code and other regulations address some of these issues, but designers and builders are still left with a challenge of providing acoustic quality - not always with clear regulatory guidance.

Building Code covers connected buildings

The current Building Code provides a minimum level of protection of acoustic amenity between adjacent dwellings but only for connected

buildings and only for sound travelling through the inter-tenancy connections.

Building Code clause G6 *Airborne and impact sound* protects occupants from a neighbour's reasonable noise, including voice, entertainment and footsteps. However, this protection only applies to *common building elements*, such as the shared wall or the common floor/ceiling between apartments.

It applies to medium-density apartments, terraced housing and semi-detached units in the same way as for high-density apartment buildings - mandating a minimum level of acoustic performance from common building elements.

In practice, this leads to heavier internal linings, the use of infill insulation and resilient fixings.

Where vertical connections exist, the impact insulation requirements generally result in a massive floor and a resiliently fixed ceiling as well as a stringent examination of the flooring underlay material.

No requirements if unconnected

Where adjacent dwellings are not connected, there is no requirement in the Building Code to achieve sound insulation performance.



Anecdotal evidence suggests that high performance is generally achieved between two nearby detached external façades - well in excess of Building Code inter-tenancy requirements.

However, there have been cases where normal noise - footsteps, speech, piano - can be easily heard next door. Windows, ground-borne connections or other acoustically weak façade elements may be responsible.

District plan or body corporate may step in

District plan noise limits regulate the amount of noise that can be created at a residential boundary. These limits, however, generally exclude normal household noises, and the assessment methodologies are often poorly defined for small strips between buildings.

In many medium-density housing situations, these interfaces are left to the body corporate to manage. They generally do so by controlling resident behaviour rather than by improving the standard of buildings.

In some city centres, the district plan imposes an additional requirement that the building façade must be built to achieve a certain sound insulation standard. Although designed for protection from community noise, this can drive improved insulation from neighbour noise as well.

G6 under review

Clause G6 is currently under revision and may include a requirement for performance between open or common spaces and habitable spaces. This may address the opportunity for acoustically weak façade elements to compromise the inter-tenancy performance of detached houses in a medium-density environment.

In the meantime, it falls to the developer to undertake the careful design required to achieve good performance between detached units.

Go above Code for quality acoustics

It should be stressed that the Building Code requirement is a minimum performance requirement - providing adequate protection from reasonable noise. It is generally necessary to exceed these minimum requirements to produce a high-quality acoustic environment.

This design process must extend to other noise factors that are relevant to medium-density housing such as:

- separation of noise-sensitive spaces, such as sleeping areas, from living spaces
- finding appropriate locations for heat pump external units

- ensuring that noise from vehicle movements along driveways or from people using common footpaths doesn't intrude on private living areas.

In well planned projects, these issues can be satisfactorily resolved. Separating garage entrances and front doors from bedrooms can be achieved by spatial separation or mirrored floor plans.

Recreation areas, external heat pump units and other fixed mechanical plant may be grouped on the site to minimise the noise constraints on the layout and the location of sensitive living areas.

Case studies evaluated performance

Three Ministry for the Environment case studies on medium-density housing show a mixture of satisfaction with protection from 'noise between their home and other neighbouring units'.

Although all three case studies primarily examined adjoining tenancies (where the Code specifically controls inter-tenancy noise insulation), the surveys also considered residents' satisfaction levels with other aspects of neighbour noise.

In the Christchurch case study, inter-tenancy noise was cited as a specific dissatisfaction - although the building complies with the minimum requirements of the Building Code. By contrast, the Wellington and Auckland case studies claim good results for protection from traffic noise and noise from adjacent units.

The response of occupants likely depends on their expectations as well as the objective acoustic performance of the development.

Medium-density housing could be a step closer to neighbours or a step further away, depending on their previous living experiences.

Planning is key

The planning involved in comprehensive medium-density developments is the key difference separating the Ministry for the Environment's definition of medium-density housing from intensification by infill housing and subdivision of existing buildings.

By considering noise during concept design, setting appropriate performance criteria and using appropriate constructions, a good degree of acoustic amenity can be achieved while increasing the utilisation of available residential land.

Living in closer proximity to neighbours always carries the potential for greater noise effects. Quality acoustics in medium-density housing depends on good planning, a willingness to exceed minimum regulatory requirements where appropriate and good communication of expectations with residents. ◀

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