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Memorandum

To:	John Sule, Dunedin City Council
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Meeting ☐ Telephone ☐ Memorandum ☑ File Note ☐

Further to my evidence prepared for the Hearing Panel for Plan Change 1 to the proposed Second Generation Dunedin City District Plan (2GP) dated the 13th of May 2025, this document responds to specific additional queries from the Hearing Panel.

Query 1: Can we [DCC] reconsider a limit [assumed to mean 'noise insulation requirement'] of DnT,w + Ctr > 40 (or 45)

As noted in my evidence, achieving a noise insulation requirement of 40 $D_{nT,w} + C_{tr}$ requires very careful design and construction of dwellings, and it is likely to be a significant barrier to residential development in reality. In zones where the Plan is seeking to enable a 'mixed use' environment, the appropriateness of having a subtle technical acoustics requirement, which is contrary to the overall objective of the zone, would need to be considered. If the desired outcome was to discourage new noise sensitive activities, it may be more transparent to change the planning status of noise sensitive activities in these zones.

In my experience, the restrictions embodied in a 40 $D_{nT,w} + C_{tr}$ requirement will not be obvious to developers until after they have committed significant resources to purchasing a site and progressing a building design. Only then will they learn that the project may not be financially viable or requires complete redesign, due to the acoustic requirements. Challenging aspects include:

Glazing

Even for small rooms with a single external façade the following upgrades may be required:

- Double window minimum 200 mm air gap between the two panes, with the sum of the thickness of the two panes no less than 14 – 16 mm. For example, 10 mm float glass / minimum 200 mm air gap / 6 mm float glass.
- Commercial framing greater than 36 mm to accommodate glazing such as 13 mm PMMA acoustic laminated glass / 12 mm air space / 13 mm PMMA acoustic laminated glass.

- Double glazing in a UPVC frame (9 mm laminated safety glass with SI / 16 mm airgap / 10 mm float glass)
- Sliding doors and the like will not be able to be accommodated.

Solid façade elements and roof / ceiling

Likely to require concrete elements or high mass façades with upgrades such as 9 mm RAB and 2 layers of 13 mm GIB Noiseline plasterboard or double framed walls.

Query 2: Is there any data available on the additional cost of achieving DnT,w + Ctr > 40 or higher?

While issues relating to cost are generally outside my area of expertise, I expect the cost of a change from 35 to 40 $D_{nT,w} + C_{tr}$ to be significantly higher than the cost of an increase from 30 to 35 $D_{nT,w} + C_{tr}$. In addition to the simple 'increased material cost', thought would need to be given to how to quantify the cost associated with projects where a complete redesign is required, or significant structural changes were required to accommodate the greater weight of the acoustic elements. There would also be a cost associated with projects which were delayed or abandoned.

Query 3: Should all habitable/living areas (not just bedrooms) be insulated to the same standard?

The current façade insulation requirement for living areas is 30 $D_{nT,w} + C_{tr.}$ Australian / New Zealand Standard AS/NZS 2107:2016 *Recommended Design Sound Levels and Reverberation Times for Building Interiors* standard recommends noise levels for living areas which are 5 dB higher than the recommendations for sleeping areas. It therefore follows that the noise insulation requirement for living areas can be 5 dB less stringent than for sleeping areas.

Query 4: Is there any data available on the additional cost of insulating all habitable/living area?

As above, cost analysis is generally outside my area of expertise. However, I am aware of various studies which have been conducted typically concluding that dwelling upgrades to a standard in the order of 30 $D_{nT,w} + C_{tr}$ may incur a $10,000 - $20,000 cost, whereas the cost above 'basic construction' of achieving 35 $D_{nT,w} + C_{tr}$ is more in the order of $20,000 to $40,000. These figures include upgrades to living areas and bedrooms – however based on a typical ratio of façade sizes / number of bedrooms, perhaps 20 – 40 % of this cost is likely to be 'living area specific'.

I trust this information is of assistance. Please do not hesitate to contact me to discuss further, as required.

Regards,

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