SRL
Acoustics | Noise | Vibration

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Acoustic News

Issue 6 - Controlling Environmental Noise

Last month we looked at noise and the law, and saw that in SA there are really only regulations for external or "environmental" noise. In this issue we'll briefly go through the three primary methods of reducing environmental noise: distance, screening, and attenuation.

Many designers (and QSs!) start to suck their teeth and add zeros onto prices when someone mentions noise attenuation. Here's the simple truth: noise attenuation does not have to be expensive. There are often cheap (even free!) solutions, if you know what you're doing. Below are the three most effective methods; you know us, cheapest first!

1. Move

Simple. Noise decreases as you move further from the source. Take your earphones out your ears and hear just how quickly your music or podcast gets quieter. The noise level is dropping by 6 dB every time you double the distance between your ear and the earphone. And that noise reduction is totally free. So move the plant somewhere else, or move your noise sensitive room further from the noisy road (roads are a special case—noise drops off by 3 dB every time you double the distance—but the principle holds).

Remember that moving things around on site is easy while in the crayon and tracing paper design stage. It is more difficult and expensive if you do it later. When laying out your site, a quick meeting with your friendly acoustician can save major headaches later.

The key here is that the first move is the most effective. Moving from 1m to 2m makes as much difference (6 dB) as moving from 100m to 200m. So distance works for a while, then you run out of space on your site. If you still need more attenuation, see method 2.

2. Noise screens

Noise screens reduce noise over short distances by anything between 5 and 20 dB, depending on by how much you break line of sight between the source and the receiver. If you just about break line of sight, you already get a 5 dB noise reduction.

Don't rely on screens for noise reduction over long distances (kilometres) or for noise with lots of low frequency. They don't work well for these scenarios.

What can you use for a screen? Well, you can go and buy an "Acoustic Screen" but it will probably be over-priced. The screen must of course be solid—absolutely no holes—so getting a tight fit to the ground is critical. To make sure of this, screens are often dug slightly into the ground when built on uneven ground.

And the screen build-up? If it's at least 7 kg/m^2 (surface mass) then it'll do. Steel sheeting or T&G timber boards work well, as they fit snugly together. Feather boarding doesn't work as after a season the slats warp and open big holes in the screen. Vibracrete works, providing you seal between the panels as they very seldom fit together snugly (T&G style). Earth berms (often used next to roads) work well too, and look prettier than a concrete wall.

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What about trees, hedges and planting? The short answer is they don't stop noise. There is a school of thought that they may even make the situation worse as you are replacing soft, noise absorbent ground or grass with hard wood. Planting is however a useful psychological aid as it hides the noise source. It unfortunately doesn't reduce the measured noise level, despite the apocryphal stories claiming otherwise. The best way to use planting is to hide your noise screen with it, thereby getting the best of both worlds.

3. Attenuation at source (quieter kit)

This is a last resort. Attenuation packages are expensive. The "acoustic" version of plant will also cost way more than the standard version. Quieter plant is often heavy and bulky, which isn't great if they're on your roof deck. Try optimising your distance and screens first. The exception is the external backup generator, which usually needs an acoustic package or its own plant room.

SRL SA: we won't waste your money

Gee-whizz designs are usually expensive, and often work as well as a well thought out, simpler and cheaper solution. We always aim to fit your noise attenuation into your budget. Call us on +27 21 680 5305 or email srl@srlsa.co.za.