WIELAND ACOUSTICS
noise & vibration consultants

What Type of Noise Control Should I Use?

Planners, engineers and architects have a tough job. Every new project has its own set of issues, needs and constraints, and somehow everything has to be balanced to come up with a project that works. Of course, our favorite issue is noise, so that's what we'll address here. Specifically, we'll explore some of the methods that can be used to mitigate noise impacts.

Location, Location, Location

When possible, noise-sensitive projects should be located in quiet areas of the community. Unfortunately, we don't always get to choose our sites, so how do we make a difficult site work? Frankly, sometimes we can't. There are some projects that are just not suitable in certain locations. For the rest, though, it is important to locate the noise-sensitive areas of the project away from the noise sources. To the extent possible, use parking lots to provide some distance between the source and receiver. Or use non-sensitive commercial or office buildings as a physical barrier between the noise source and the sensitive receptors.

Building Orientation

If noise-sensitive buildings need to be located adjacent to a noise source, try orienting them so that the exterior living areas (patios, play areas, etc.) are on the opposite side of the building from the noise source. Also, be aware that buildings not only block noise but can reflect it as well. Buildings should not be oriented relative to each other in a way that creates reverberant spaces where noise levels are higher.

Noise Barriers

Barriers can include walls or berms at the property line(s) of the project site or, in the case of multifamily residential construction, walls around patios and balconies. The purpose of the barriers is usually to mitigate the noise level at exterior living areas, recreational areas, outdoor areas where people tend to congregate, or other exterior areas where peace and quiet is desired. If constructed with the proper geometrical relationship between a noise source, barrier and receiver, barriers can be an effective method of noise control.

There are many types of barriers that can be used. Walls can be constructed of block, stucco, glass, Plexiglas, wood or any material that provides a surface density of at least 4 lbs./sq.ft. Where more noise reduction is needed (or where reflections from barriers are a concern) the barrier can be covered with sound absorptive panels, providing an extra 1 to 2 dB of noise reduction over a standard wall of the same height. But for the best performance, it's hard to beat a berm. Berms can provide 3 dB more noise reduction than a wall of the same height. And they look nicer too!

Landscaping

As a method of noise reduction, this involves planting trees, shrubs or other landscaping between a noise source and a receiver. There appear to be psychological benefits to using landscaping to block the view to a noise source, and people will swear that the noise is less after planting a few trees and bushes. However, a thick growth of leafy trees and underbrush that is at least 100 feet deep is required to be even marginally effective, and there's seldom room for that!

Building Construction

Typical residential building construction provides a noise reduction of up to 20 dB with windows and doors closed, while typical commercial construction can provide a noise reduction of up to 25 dB. Higher reductions can be achieved by installing sound-rated windows and doors, upgraded wall and roof construction, an appropriate ventilation system design, and sound absorptive materials in the interior spaces to minimize reverberation.

Dual Pane Windows

There is a common misconception that dual pane windows can solve almost any noise problem. In actual fact, dual pane windows are often no better (and are sometimes worse) than single pane windows. If there is a noise problem to be resolved, use sound-rated windows. They have been designed from the frames to the glass with noise control in mind, and have been tested in a laboratory to verify their performance. They cost more, but they work.

Our Thanks

We want to thank Mr. Ken Montgomery, Director of Public Works for the City of Laguna Niguel for his comments, which prompted this article. We hope we have answered your question! If you have a question or an idea for an article, we'd love to hear from you.