Noise: barriers and enclosures

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Hazard control guidance sheet

Using barriers and enclosures to eliminate or reduce the risk of harm from noise

Description

In their simplest forms, barriers and enclosures are walls built to shield or enclose a noise source. They work by blocking sound, either partially (barriers) or fully (enclosures), between the source and the receiver.

Enclosures are generally more effective at reducing noise emissions than barriers. They fully enclose the noise source and are lined with a sound absorbing material.

Barriers are often used when the noise source is too large to fully enclose, or there are multiple noise sources. Large concrete noise barriers erected alongside highways and noise absorbing temporary barriers erected around roadwork or construction are examples.

Figure 1. A full noise enclosure with acoustic louvres around ventilation system machinery.

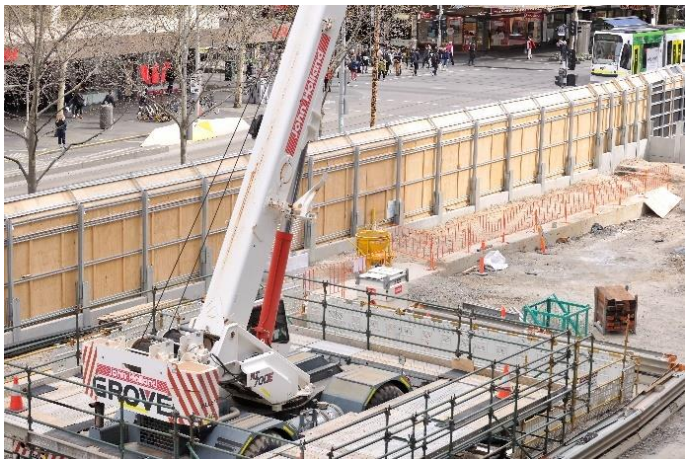

Figure 2. A temporary noise barrier erected around construction machinery to shield foot traffic from excess noise.

More information

See our website: **epa.vic.gov.au/for-business/find-a-topic/noise**

Contact us:
1300 372 842 (1300 EPA VIC) or
contact@epa.vic.gov.au

The actions you take and the controls you decide to implement will support you to comply with your general environmental duty and other duties under the *Environment Protection Act 2017*.

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Type of control

Physical.

When to use this control

Barriers and enclosures are commonly used noise control solutions.

Typically, barriers and enclosures are seen around refrigeration, heating, ventilation, and air conditioning (HVAC) systems. They can also be found around cooling towers, chillers, pumps and other plant equipment.

Suitable for:

- mobile plant and outdoor equipment
- air handling and ventilation systems
- cooling towers
- air conditioning systems
- refrigeration units
- dust extraction systems
- trash compactors.

Industries that would use this: barriers and enclosures are broadly applicable across a range of industries. Any industry that uses a HVAC system could use a barrier or enclosure.

Examples include:

- landfill
- waste transfer stations
- recycling facilities
- truck and bus depots
- manufacturing facilities
- shopping centres
- processing facilities
- residential buildings, hotels, hospitals and office blocks
- car washes.

Details and considerations

Barriers and enclosures can be effective noise controls. However, before implementation, there may be more cost-effective solutions you can explore.

Some examples of more cost-effective solutions include:

- installing quiet or energy efficient equipment
- improving maintenance
- reduction or optimisation of fan speed
- relocating noisy equipment
- fitting fans with duct attenuators or silencers
- lining ducts with sound absorbent material.

It is important to understand your noise sources and what is possible in your case. For example, a reduction in fan speed may not be possible when considering odour or dust pollution.

The material, construction and exact specifications of your noise barrier or enclosure would be best determined in conjunction with an acoustic engineer/consultant for optimal results. Final design will vary depending on the frequency (in Hz) of the produced noise.

Barriers

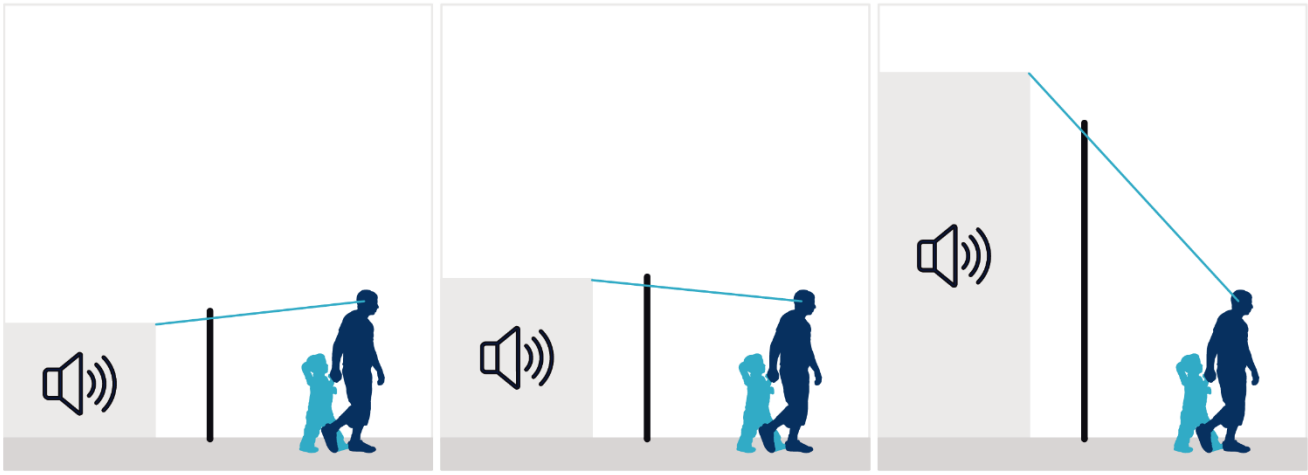

Figure 3. The height a barrier needs to be in relation to noise-sensitive areas' visible lines of sight.

Things to consider for barriers:
• Barriers are an effective option for temporary noise sources, and can reduce noise emissions by 10–15dB(A)*. However, when considering barriers for permanent noise sources, they can become very expensive.
• They do not fully enclose a noise source, so it is important to think carefully about the design of your barriers before you implement them. This will ensure you get the maximum noise control available to you.
• As a rough guide, a barrier should typically be at least five times wider than it is high. The height should allow no part of the noise source to be visible from the noise-sensitive area.
• Also consider potential wind pressure for outdoor barriers. This will help make sure they remain effective and do not become a safety hazard.

* A frequency weighting that represents the human response to sound and its frequency variation in a typical range of magnitude for environmental noise levels.

Enclosures

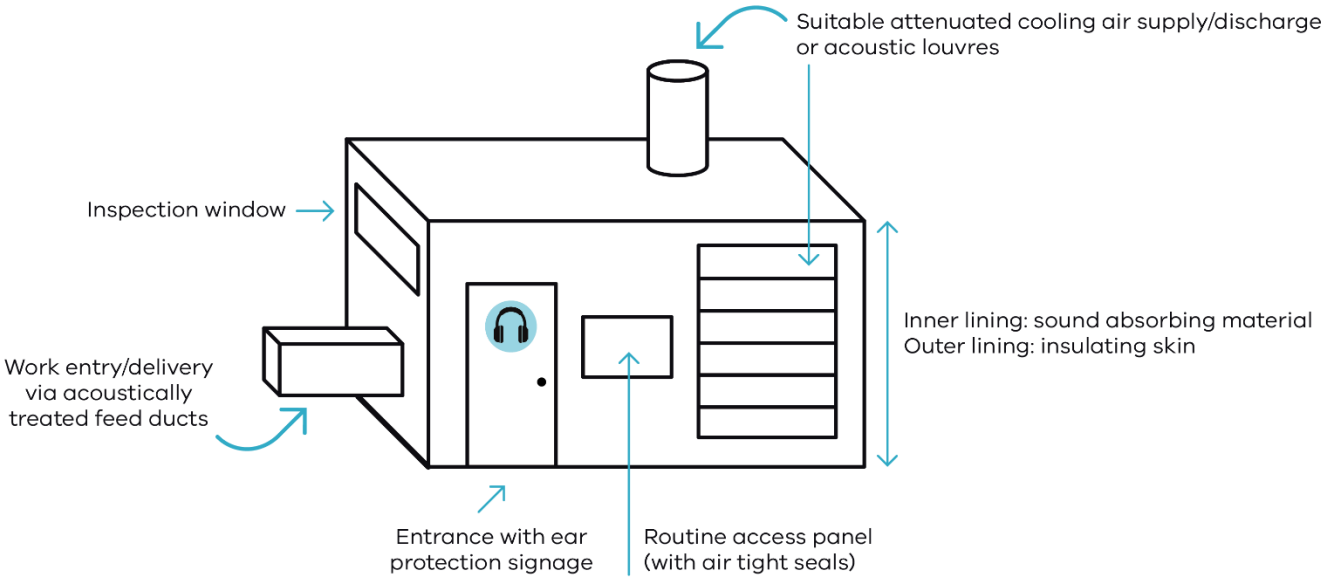

Figure 4. The typical components of an acoustic enclosure around machinery.

Things to consider for enclosures:
• Enclosures need to surround the noise sources as completely as possible, lined with an efficient sound absorbent material.
• It is important that enclosures are designed with sufficient acoustic treated ventilation or doors and sealed access hatches (see publication 1885).
• Enclosures are often more effective than barriers, being able to reduce noise emissions by 10–35 dB(A).
• The performance of enclosures will vary depending on your individual circumstances. However, enclosures with acoustically treated ventilation, doors and sealed access hatches have been shown to achieve noise reduction levels reaching up to about 35 dB(A).

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Engaging an acoustic consultant

An acoustic consultant will typically be a person who is eligible for membership of the Australian Acoustical Society. The business a consultant works for will typically be a member of the Association of Australasian Acoustical Consultants.

See Work with an environmental consultant (EPA website) for general information about how to engage a consultant.

This control is an *example or option only* of what you could put in place to eliminate or reduce the risk of harm to human health and the environment. You can implement other controls, so long as you can demonstrate you have eliminated or reduced the risk of harm as far as reasonably practicable (EPA website).