

Noise from large plant

Specific challenges demand specific solutions

Typical noise levels associated with site activities (HSE figures):

Running power packs/compressors
85-91dB

Grinding
85-109dB

Breaking concrete, asphalt and similar with hand operated breakers
96-105dB

Abrasive disc cutters/angle grinders
98-104dB

Driven piling
115-132dB

By comparison:

Typical office
60dB

Living room
50dB

Certain pieces of equipment used on construction sites present very specific challenges when it comes to shielding both site workers and nearby residents from the noise generated. This paper examines these challenges and suggests how they can be handled.

Although the challenges that each type of machine creates are very different, the fundamental principles of noise control are what each solution is designed to achieve: positioning the acoustic barrier as close as possible to the source of the noise, and blocking the line of sight between it and the people affected.



Noise from construction works

Section 61 of the Control of Pollution Act 1974 allows developers and their building contractors to apply for 'Prior Consent' for noise generating activities during the construction phase of a development. This proactive approach requires the assessment of the construction working methods that will be used to undertake the work and the prediction of likely construction noise levels. It is intended to manage the generation of construction noise using the 'best practicable means' available to complete the works.

In the absence of a Section 61 agreement, councils can serve a notice on people carrying out construction or demolition works and specify how the work should be carried out to avoid a potential statutory noise nuisance. Those failing to comply with the notice can be prosecuted and fined an unlimited amount, with further fines for each day that they fail to comply.

Decibels

- Sound levels are measured in decibels (dB)
- 1 decibel is the just noticeable difference (JND) in sound intensity for the normal human ear
- Decibels measure the intensity – not loudness – of sound
- The 'bel' part of decibel is named after Alexander Graham Bell
- The 'deci' part indicates that the decibel scale is based on powers of ten
- Were it not based on powers of ten, the scale would run from zero to a trillion!
- A noise measured at 100dB is ten times the intensity of one measured at 90dB
- It takes about ten times the intensity of sound for it to sound twice as loud to the human ear
- 100dB therefore sounds around twice as loud as 90dB

Diesel generators:

The noise from generators emanates at very low frequencies, and moves in waves that travel a lot further and through materials that high frequency sounds don't penetrate.

During the normal working day, generator noise is usually masked by general ambient noise, but generators are typically used to power critical applications that need to be kept going around the clock. Consequently, complaints usually arise outside normal working hours once the ambient noise drops, especially overnight. The low 'throb' of a generator is then perceived as a real nuisance by people trying to sleep.

To be effective at tackling this problem, the noise control measures used must have high absorption levels and the highest possible density to 'catch' and retain the low frequency soundwaves.

As with all noise control, the line of sight between the noise source and the people suffering its effects needs to be blocked. A good proportion of the noise from a generator is actually from the exhaust, which is typically sited on top of the generator itself. We therefore recommend a combination of sound control measures to deal with the specific noise from the exhaust and then the generator as a whole.



In this picture, a generator has been wrapped by RVT's E3/3 Generator Enclosure. This delivers noise attenuation of between 14.9dB at 50Hz to 59.9dB at 5000Hz. In addition, an A2/3 Soundex Exhaust attenuator sits on top of the generator to subdue noise from the exhaust outlet.

The Control of Noise at Work Regulations 2005

Action is needed when there is exposure to specific 'action values' of noise averaged over a working day or week:

Lower exposure action values:

- Daily or weekly exposure of 80dB(A) or peak sound pressure of 135dB(C)

Upper exposure action values:

- Daily or weekly exposure of 85dB(A) or peak sound pressure of 137dB(C)

There are also absolute levels of noise exposure which must not be exceeded:

- Exposure limit values
- Daily or weekly exposure of 87dB(A) or peak sound pressure of 140dB(C)

Excavator with breaker attachment:

An excavator fitted with a hydraulic breaker attachment is very effective at breaking up concrete, tarmac and the like, but also extremely loud, – well in excess of 100dB. This repetitive loud noise is often continued for a long period of time and is very intrusive for those in homes, shops or offices nearby.

The best solution here is an enclosure that surrounds the breaker as much as possible without impeding the work. The enclosure achieves the aim of containing the noise as close as possible to the source, but can also easily be moved, enabling it to follow the breaking work as it moves across the site.



This Soundex E7/2 breaker enclosure is available in 2m and 3m high versions to accommodate different sized machines. It has three sides and a roof of acoustic material that sit around the breaker attachment. The open side allows the driver to remain outside the enclosed area while still giving full visibility of the attachment – in particularly sensitive locations, temporary fencing with acoustic curtains can be used as an additional acoustic shield behind the machine. Thanks to its mobility, the enclosure can easily be moved along as the work progresses. In addition, its sturdy design means fragments thrown up by the breaker are contained without the need for additional debris fencing or netting. Noise attenuation of between 13.6dB at 250Hz and 32.3dB at 5000Hz is achieved.



Piledriver:

The hammer piling of steel piles is continuous, noisy work often carried out at night and so creating a real nuisance for any surrounding residents. The most intense noise from this activity comes from the 'ring' that results from the hammer head hitting the top of the pile. The sound is very highly pitched and can be easily heard over some distance.

Once again, following the principle of the acoustic barrier being as close to the source as possible, the best solution involves the pile itself being wrapped in a composite shroud. However, the amount of pile exposed above ground diminishes as it is sunk, so any acoustic wrap has to adapt to this.

Further information

[Gov.uk:
Noise nuisances](#)

[HSE Noise Topic
Inspection Pack](#)

[The Decibel Scale](#)



This picture shows RVT's A1/3 Piling attenuator wrapped around the section of pile. Each unit wraps a half metre section of pile, held to it by extra strong magnets. As the pile is driven into the ground the separate attenuators, which are held together by Velcro connectors, can easily be removed.

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