

Ways to control noise from construction activities

Best practicable option (BPO) to manage noise.

Screening

Building near to sensitive adjoining properties early in the construction programme can help to screen and contain noise from later construction work. Permanent fences or barriers that are part of the final design, as well as boundary hoardings and site huts, can also act as acoustic screens, especially if there are no gaps.

Take care where you locate stockpiles of materials if you plan to use them to screen noise. If they are too close to sensitive adjacent properties, noise associated with movement and handling can cause problems.

Simple purpose-built screens and enclosures

Materials such as plywood or chipboard panels can be lined with sound-absorbing material such as mineral wool to create noise containing screens or enclosures. The length of the barrier should be greater than its height. If possible, the noise source should not be visible and the barrier located as close as possible to either the source or the receiver.

Simple portable screens, located very close together, can effectively reduce the effects of noisy work in small areas, including jack hammering or plate compaction.

Design details of acoustic screens, enclosures and sheds can be found in NZS 6803:1999. Screening may be essential when any noisy work is proposed outside of standard construction hours.

Concrete pouring

Concrete pouring starting before 7.30am is not normally permitted unless there are good road control reasons. The noise from concrete pumps is likely to cause complaints from nearby residential sites when the neighbourhood is otherwise very quiet, even in the central city. It pays to place concrete orders early so that suppliers can offer a choice of delivery times after 7.30am. To avoid the need to extend construction hours, architects and engineers may be able to incorporate reduced slab sizes in the design. The use of accelerants and heaters should also be considered to reduce setting times. Concrete pumping should be located away from sensitive boundaries.

Breaking of concrete

Use of traditional rock breakers attached to excavators is one of the most common causes of noise complaints, especially if it takes place on or near to a common, or shared wall of an occupied building. Where possible use equipment that breaks concrete by crushing it rather than drilling through it. Always consult the occupants of adjoining properties before work starts. Hydraulic and chemical expansion methods are less noisy methods worth considering. Even explosive methods can be tailor-made for the job and may be appropriate.

Site monitoring

Look out for engines left idling when not in use, noisy mufflers on plant and noisy site radios. Make sure that unnecessary metallic impact noise is avoided from dropping scaffolding poles, placement of roading plates, moving metal fencing and the clanking of chains on crane hoists.

Ensure that machines are maintained regularly – they will be quieter. Simple maintenance can reduce noise levels by as much as 50 per cent. Check for noise problems if you notice workers having to shout at arms-length to converse. This indicates that the noise level may be above 90 dBA at this location.

Noise reduction with distance

Move static plant and equipment as far as possible from sensitive boundaries, as work allows. A distance of four times further away lowers the noise by 12 dBA. A reduction of 10 dBA will sound half as loud.

Plant and machinery

In some cases, quiet plant and machines are available which are specifically designed to produce less noise. Examples are muffled breakers (the noise of a typical silenced breaker can be reduced by 16 dBA if a purpose-made muffler is fitted) and silenced diesel generators and compressors (some units are up to 15 dBA quieter). Generally, electrically powered equipment such as chain saws and cranes are noticeably quieter than diesel-powered equipment and hydraulically powered equipment is quieter than pneumatic power.

Cutting metal using gas cutters is far less noisy than using grinding methods to dismantle metal structures. When replacing exhaust and intake mufflers, ask for quieter options which are often available.

Similarly, specified plant and equipment such as excavators can also operate at very different noise levels. Look for and specify, lowest sound power level (shown as a PWL or SWL) marking when buying or hiring plant or equipment. A 10 dBA lower SWL or PWL rated-level will sound approximately half as loud.

Keep machinery covers and panels closed and well-fitted. Bolts and fasteners should be done up tightly to avoid rattles. Avoid equipment that is either over or under powered.

Saw cutting of pavers and pavement slabs

A cutting station should be established with the saw enclosed in an acoustic enclosure. A simple screen is unlikely to be effective in city streets due to reflected noise effects. A water supply should always be made available and the saw blade changed regularly to avoid an annoying high pitched "whining" noise from developing.

For any saw cutting

Choose a saw blade with the greatest number of teeth and of the smallest width. Choose a blade with gullets as small as possible. Choose a blade with built in vibration dampening slots.

Drop hammer piling

This is potentially the noisiest construction site activity. Choose quieter types such as augured or vibratory piling as a first option.

Unless it is shown that there are good engineering reasons to confirm that the ground conditions are not suitable, the choice of drop hammer rigs should be a last resort. Where drop hammer piling is shown to be the only suitable type, other noise reducing techniques should be adopted.

These options include reducing the noise from the contact of the hammer with the pile helmet by using purpose-made dollies or blocks of plywood. The design of the equipment and the pile helmet should ensure that damping can be utilised in this way. It is also possible to add shrouds to help contain noise at the hammer or enclose the entire pile and hammer. Planned breaks may be necessary to fit in with the business or activities happening in neighbouring properties.

Audible reversing signals

These signals are very penetrating by design and can be turned off, or the tone changed in some circumstances, but talk with the Department of Labour OSH inspector first to ensure that site safety requirements are maintained.

Examples of screening methods

These diagrams have been reproduced from New Zealand Standard NZS 6803:1999 Acoustics – Construction Noise with permission from Standards New Zealand.

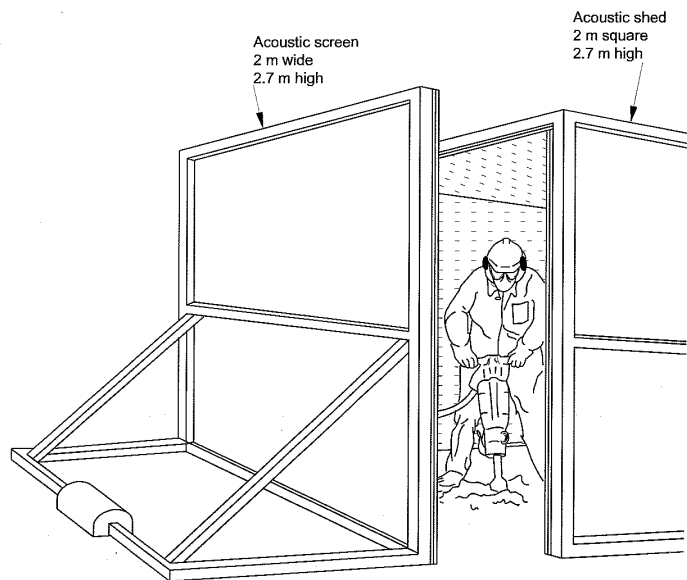
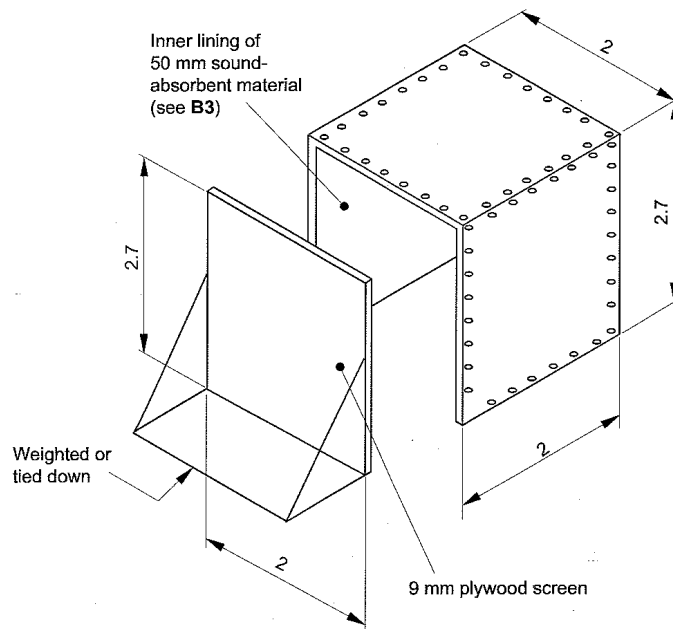


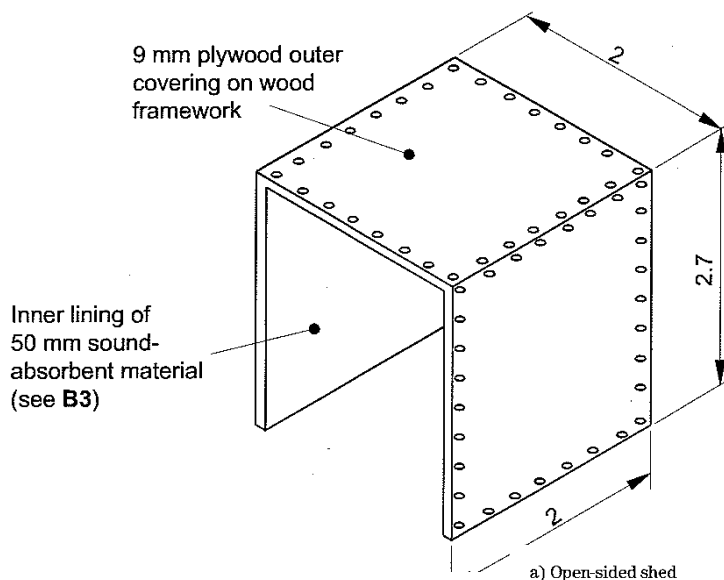
Figure B.2 Typical acoustic shed



b) Open-sided shed with screen

Unless otherwise stated, dimensions are in metres

Figure B.3 Examples of acoustic open-sided sheds



a) Open-sided shed

Table B.4 Measured sound reduction given by types of partial enclosure

Type of enclosure (see figure B.3)	Reduction dB(A)		
	Facing the opening(s)	Sideways	Facing rear of shed
Open-sided shed lined with absorbent material; no screen	1	9	14
Open-sided shed lined with absorbent material; with reflecting screen in front	10	6	8
Open-sided shed lined with absorbent material; with absorbent screen in front	10	10	10