

Specifications

All contractors are responsible for ensuring the reversing alarms on their vehicles are of an appropriate specification to ensure a safe working environment. As a guide, the following reversing alarm requirements are likely to be appropriate on most NZTA projects:

- broadband
- directional
- automatic level adjustment over a range of approximately 20dB
- maximum rated level approximately 97dB.

This guideline is appropriate for medium vehicles on typical urban sites. A higher or lower rated level may be appropriate for other vehicles and sites.

Suppliers

For the NZTA Victoria Park Tunnel and Newmarket Viaduct projects, the broadband reversing alarms cost between approximately \$100 and \$400 (2011) and were primarily supplied by:

- Rearsense, www.rearsense.co.nz, model SA-RRA-97
- Capital Instruments, www.capitalinstruments.co.nz, model BBS97SA.

Fitting

Reversing alarms require two wires to be connected. In many cases, they are a standard size, allowing them to be directly swapped with the alarm originally supplied with a vehicle.

As broadband alarms produce a 'beam' with the loudest noise in one particular direction, it is important that the alarms are fitted with an unimpeded view facing backwards from the vehicle.

Alarms should always be fitted by a suitably qualified technician.



A broadband reversing alarm

Further information

NZTA Transport Noise website
www.acoustics.nzta.govt.nz

Dr G Leventhall, *The loudness of broadband alarms and audibility over machine noise*
www.brigade-electronics.com/sites/default/files/Loudness%20of%20Broadband%20Alarms%20Final.pdf

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Construction noise

Reversing alarms

Tonal beeping alarms on reversing construction vehicles are a common cause of noise complaints. All construction vehicles on NZTA projects in urban areas should preferably be fitted with broadband reversing alarms to minimise disturbance to residents.



Tonal alarms

Traditionally, all construction vehicles have been fitted with a tonal alarm that makes a loud beeping noise as the vehicle reverses. The noise from these alarms is distinctive due to the single frequency (tone) of noise being produced. Consequently, as well as achieving the goal of attracting the attention of construction workers behind the vehicle, the alarms can be disturbing for nearby residents.

In many situations such as at ports and quarries, as well as road construction projects, tonal reversing alarms are the most common reason for noise complaints, particularly at night. Other noise sources may last longer and are often louder, but the distinctive characteristics of tonal reversing alarms usually cause greater disturbance.

Broadband alarms

Broadband reversing alarms generate noise across a range of frequencies. The noise level varies and these are sometimes described as 'squawkers' or 'quackers'. Close to a vehicle, these alarms can be as loud as traditional beepers, but at a distance the noise does not have the same distinctive characteristics as a tonal alarm and therefore causes significantly less disturbance.

Broadband alarms generally produce a beam of noise, and are significantly louder in one direction compared with other directions. When correctly fitted with the beam facing backwards, the alarm will be loud behind the vehicle where workers need to be made aware of the vehicle reversing, but less noise will be 'spilled' in other directions towards residents. The noise in neighbouring areas can therefore be reduced while maintaining the safety of workers.



Broadband alarms generate warning noise in the danger zone but less spilled noise than tonal alarms

Victoria Park Tunnel, 2009–2012

The Victoria Park Tunnel project in Auckland was the first NZTA project where broadband alarms were made mandatory for all vehicles on site. The project Alliance team procured a bulk order of broadband reversing alarms for contractors to fit to their vehicles. Also, one of the larger contractors separately purchased and fitted broadband alarms to all their vehicles.

No health and safety issues arose from the use of the broadband alarms on this project, and when standing behind vehicles the alarms appeared subjectively to be at least as loud as traditional beepers.

Residents expressed a clear preference for the broadband alarms.

Newmarket Viaduct, 2009–2012

For the Newmarket Viaduct project in Auckland, the use of broadband alarms was also made mandatory at night. In this instance, an information letter was provided to all contractors who were then required to procure and fit alarms to their own vehicles. This again proved to be successful in reducing disturbance to residents, with a stark comparison evident when complaints arose from tonal alarms on the adjacent Greenlane widening project.

For both the Victoria Park Tunnel and Newmarket Viaduct projects the biggest challenge was ensuring that all subcontractors had alarms fitted, including trucks visiting the site on a one-off basis. For future projects, tight controls are recommended to ensure all subcontractors adhere to reversing alarm requirements.

Future NZTA projects

All construction vehicles on NZTA projects in urban areas, or projects involving night works close to houses in other areas, should preferably be fitted with broadband reversing alarms to minimise noise disturbance to residents.